2575

WASTE ACCEPTANCE CRITERIA ATTAINMENT REPORT FOR REMOVAL ACTION 17 STOCKPILES 1, 2, AND 4

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

OCTOBER 1999

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

20200-RP-0004
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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

2

LIST OF ACRONYMS AND ABBREVIATIONS

ASL	analytical support level
ccpm	corrected counts per minute
CLP	Contract Laboratory Program
COCs	constituents of concern
CRDL	Contract Required Detection Limits
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
HPGe	high-purity germanium detector
IDW	Investigation Derived Waste
MDC	Minimum Detectable Concentration
mg/kg	milligrams per kilogram
mg/L	milligrams/liter
MTL	Material Tracking Location
OSDF	On-Site Disposal Facility
pCi/g	picoCuries per gram
PID	photoionization detector
ppm	parts per million
PSP	Project Specific Plan
RCRA	Resource Conservation and Recovery Act
RSS	Radiological Scanning System
SP-1	Removal Action Stockpile 1
SP-2	Removal Action Stockpile 2
SP-4	Removal Action Stockpile 4
SVOC	semi-volatile organic compound
TCLP	toxicity characteristic leaching procedure
μg/kg	micrograms per kilogram
V/FCN	Variance/Field Change Notice
VOC	volatile organic compound
WAC	waste acceptance criteria
WAO	Waste Acceptance Organization

3

1.0 INTRODUCTION AND SCOPE

This report summarizes the recent sampling and analytical results from Removal Action 17 Stockpiles 1, 2, and 4 (SP-1, SP-2, and SP-4). Soil sampling was conducted to evaluate attainment of the On-Site Disposal Facility (OSDF) waste acceptance criteria (WAC, DOE 1998). Excavation of the soil and debris from these stockpiles is scheduled to begin in Spring 2000. Debris WAC attainment will be visually verified during excavation by personnel from the Waste Acceptance Organization (WAO).

As discussed in detail in Section 2.0 of this report, the western portion of SP-1 has not yet been sampled. Following sampling and analysis, an addendum to this report will be issued to present the results and WAC attainment determination of that portion of SP-1.

Although summaries of the strategies and methods of sampling these stockpiles are included in this report, the Project Specific Plan (PSP) for Sampling of Removal Action 17 Stockpiles 1, 2, and 4 for OSDF WAC Attainment (DOE 1999) should be directly referred to for the complete background and/or specific details on a given aspect of the WAC attainment data. This PSP and associated Variance/Field Change Notices (V/FCNs) are included as Appendix A to this report.

2.0 STOCKPILE DESCRIPTION AND SAMPLING DESIGN

2.1 STOCKPILE 1

SP-1 [Material Tracking Location (MTL) W800051] is located in the northern portion of the Former Production Area, south of the OSDF Haul Road, west of the Decontamination Pad, and east of SP-4. It consists of approximately 1,500 cubic yards of soil and 500 cubic yards of debris (Figure 2-1) and is divided into distinct western and eastern portions (shown in Figure 3-2). The western portion was created in 1997 by the consolidation of soil generated during OSDF Haul Road construction. The eastern portion was created by the consolidation of excess soil and debris from various construction projects in the Former Production Area and from the consolidation of drums of Investigation Derived Waste (IDW). Only the eastern portion of the stockpile has undergone WAC attainment sampling at this time. Following WAC attainment sampling of the western portion, an addendum to this report will be issued. Currently, a silt fence is installed between the two portions of the stockpile to minimize cross-contamination between the sampled and unsampled soil. Table 2-1 lists the WAC constituents of concern (COCs) for SP-1 (see Section 1.2.2 of the PSP for details on the determination of WAC COCs for SP-1).

2.2 STOCKPILE 2

SP-2 (MTL W800052) is located in the northwest corner of the Former Production Area, east of the Solid Waste Landfill and north of Stockpile 7 (Figure 2-1). It consists of approximately 2,000 cubic yards of soil and 300 cubic yards of debris. SP-2 was created by the consolidation of excess soil and debris generated by construction projects in the Former Production Area and Remediation Area 7 (near the K-65 Silos). Table 2-1 lists the WAC COCs for SP-2 (see Section 1.2.4 of the PSP for details on the determination of WAC COCs for SP-2).

2.3 STOCKPILE 4

SP-4 (MTL W800054) is located in the northern portion of the Former Production Area, south of the OSDF Haul Road, and west of SP-1 (Figure 2-1). It consists of approximately 2,200 cubic yards of soil and 400 cubic yards of debris. SP-4 was created by the consolidation of excess soil and debris generated during sitewide underground storage tank removals and from sitewide fuel spill cleanups. Table 2-1 lists the WAC COCs for SP-4 (see Section 1.2.6 of the PSP for details on the determination of WAC COCs for SP-4).

2.4 REAL-TIME SCANNING

A real-time total uranium surface scan of each stockpile was performed using the Radiation Scanning System (RSS). In each case, the RSS scan covered as much of the stockpile surface as was practical without jeopardizing worker safety. The steep side slopes on SP-2 and SP-4 could not be scanned by either RSS or high-purity germanium detector (HPGe).

The RSS detector acquisition time was set to 4 seconds and data was collected at a speed of one mile per hour. The onboard Global Positioning System was used to obtain positioning information with each detector measurement. If any single RSS measurement had exceeded 721 milligrams per kilogram (mg/kg) total uranium, a HPGe measurement would have been taken to confirm the RSS measurement. No HPGe measurements were needed for these stockpiles.

A minimum of two Infrared Moisture Meter soil moisture readings were collected in the area covered by the RSS. These moisture readings were necessary because measurements from the RSS detectors need to be adjusted to take into account the soil moisture.

2.5 PHYSICAL SAMPLING

The physical sampling program for WAC attainment determination for SP-1, SP-2, and SP-4 is a combination of random and biased sampling throughout the stockpiles. The number of random samples collected from each stockpile was based on existing analytical data, the Remedial Investigation/ Feasibility Study sampling density in the Former Production Area, process knowledge of the stockpiles, and the sampling density in previous soil stockpile sampling projects. Based on these requirements, 10 random samples were collected from each stockpile.

To determine the locations and depths of random samples, a systematic approach was used to establish a sample grid over each stockpile surface. The grid pattern was based on surface area and consisted of ten grid blocks of approximately equal size for each stockpile. A random sample location (northing and easting coordinate) was selected within each block. Depth intervals were randomly selected at each sampling location. Alternate random depths were also selected in case of refusal at a boring location.

Biased samples were collected based on readings from a beta/gamma (Geiger-Mueller) survey meter and a photoionization detector (PID). Six-inch soil intervals with beta/gamma readings above 450 corrected counts per minute (ccpm) were to be collected and analyzed for total uranium. However, since no beta/gamma readings exceeded 450 ccpm for these stockpiles, no biased radiological samples were collected. Six-inch intervals with PID readings above background were subjected to a headspace analysis. If the result of the headspace analysis was above 10 parts per million (ppm), the 6-inch sample interval was submitted for total volatile organic compound (VOC) analysis. Ten biased samples were collected and analyzed due to headspace analysis results.

Soil cores were collected using either a hand auger or the Geoprobe® Model 5400. All borings were completed to the base of each stockpile for beta/gamma and PID field screening purposes.

TABLE 2-1
WAC COCs FOR SP-1, SP-2, AND SP-4

SP-1	SP-2	SP-4
total uranium	total uranium	total uranium
technetium-99	technetium-99	technetium-99
alpha-chlordane	bis(2-chloroisopropyl)ether	alpha-chlordane
toxaphene	4-nitroaniline	toxaphene
bromodichloromethane		bromodichloromethane
chloroethane		chloroethane
1,1-dichloroethene		1,1-dichloroethene
1,2-dichloroethene		1,2-dichloroethene
tetrachloroethene		tetrachloroethene
trichloroethene		trichloroethene
vinyl chloride		vinyl chloride
carbazole		carbazole
bis(2-chloroisopropyl)ether		bis(2-chloroisopropyl)ether
4-nitroaniline		4-nitroaniline
TCLP (VOCs, SVOCs, pesticides, herbicides, metals)		TCLP (VOCs, SVOCs, pesticides, herbicides, metals)

8

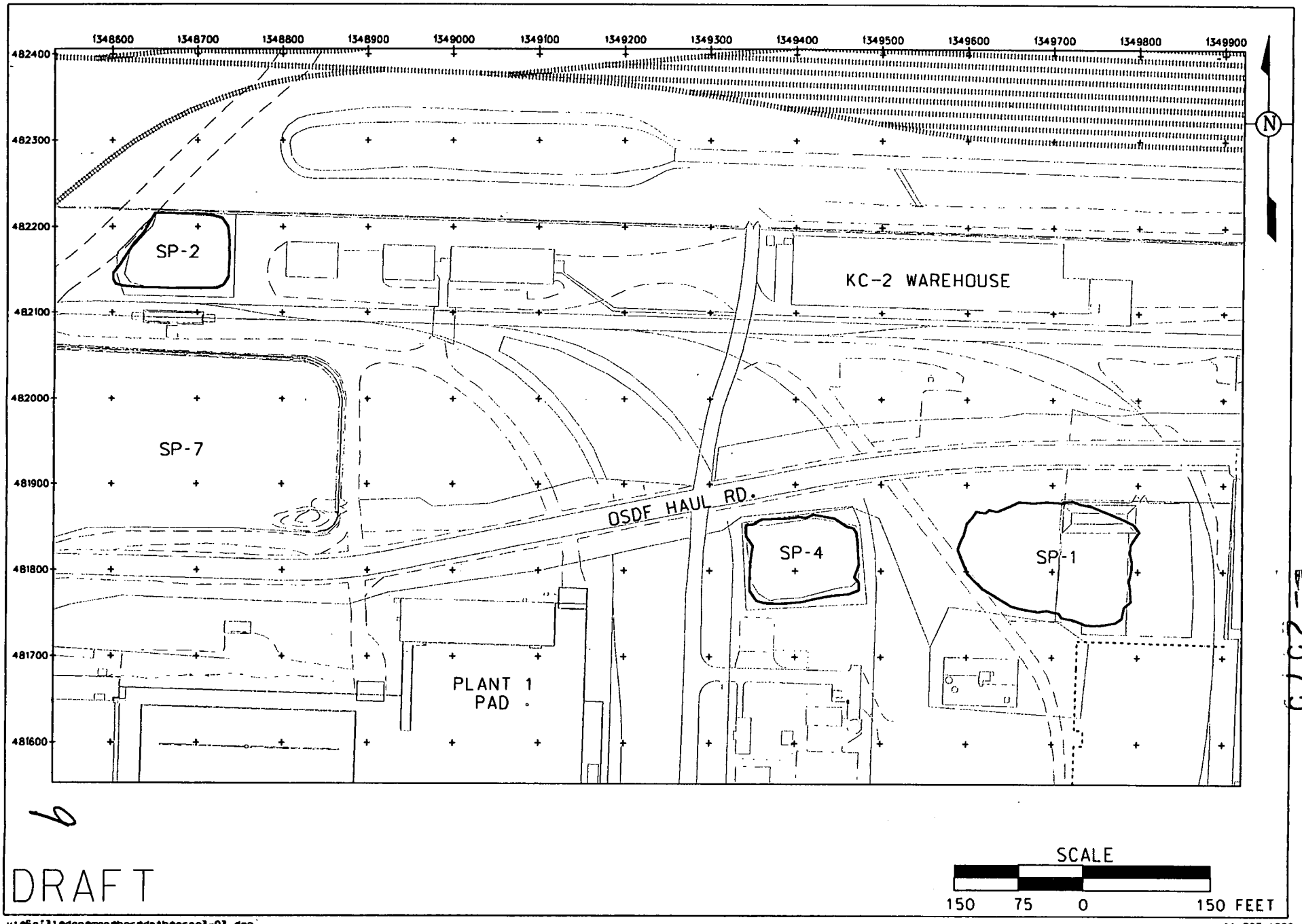

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FIGURE 2-1. LOCATION OF STOCKPILES SP-1, SP-2, AND SP-4

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3.0 DATA SUMMARY AND CONCLUSIONS

The results from physical samples collected from SP-1, SP-2, and SP-4 are listed in Appendix B. Real-time scanning and physical sampling results from individual stockpiles are summarized below. In accordance with the PSP, a minimum of 10 percent of the analytical data associated with the physical sampling was validated to analytical support level (ASL) B by the FDF Data Quality group.

As discussed in Section 1.2.2.2 of the PSP, the practical quantitation limits for 4-nitroaniline and bis(2-chloroisopropyl)ether are well above the WAC established for these two compounds. Since it is not feasible to achieve detection limits at the WAC for these two constituents using current analytical methods, the EPA Contract Laboratory Program (CLP) Contract Required Detection Limits (CRDLs) of 830 μg/kg for 4-nitroaniline and 330 μg/kg for bis(2-chloroisopropyl)ether were used as the default WAC attainment values for this sampling project.

3.1 STOCKPILE 1

As discussed in Section 1.2.2 of the PSP, based on limited existing analytical data and the various source locations of SP-1 material contents, it was determined that SP-1 required sampling for total uranium, technetium-99, and a list of 12 organic WAC COCs. In addition, Toxicity Characteristic Leaching Procedure (TCLP) testing (for the contaminants listed in 40 CFR 261.24) was conducted due to the unknown origin of some materials in the stockpile.

The RSS measured surface total uranium concentration over 844 points, with results ranging from less than the Minimum Detectable Concentration (MDC) to 217.5 mg/kg. These results are summarized in Table 3-1 and the extent of RSS coverage is shown in Figure 3-1. No HPGe measurements were conducted.

Physical sample locations are shown on Figure 3-2 and laboratory results are summarized in Table 3-2. Results for total uranium analyses ranged from 1.83 mg/kg to 102 mg/kg. Technetium-99 analytical results ranged from non-detects less than 1 picoCuries per gram (pCi/g) to a high of 2.8 pCi/g. All total and TCLP organic contaminant analyses were non-detect values (i.e., less than the EPA CLP CRDLs as listed in Table 3-2 for these constituents). TCLP inorganic results were all an order of magnitude less than the Resource Conservation and Recovery Act (RCRA) characteristic limits.

3.2 STOCKPILE 2

As discussed in Section 1.2.4 of the PSP, it was determined that SP-2 required testing for total uranium, technetium-99 and two semivolatile organic compounds. TCLP testing was not required due to existing data and process knowledge of the stockpile.

The RSS measured surface total uranium concentration over 409 points, with results ranging from less than the MDC to 188.8 mg/kg. These results are summarized in Table 3-1 and the extent of RSS coverage is shown in Figure 3-3. No HPGe measurements were conducted.

Physical sample locations are shown on Figure 3-4 and laboratory results are summarized in Table 3-3. Results for total uranium analyses ranged from 30.7 mg/kg to 105 mg/kg. Technetium-99 analytical results were all non-detects (less than 1 pCi/g). The semivolatile organic contaminant results were non-detects or estimated values less than the EPA CLP CRDLs as listed in Table 3-3.

3.3 STOCKPILE 4

As discussed in Section 1.2.6 of the PSP, based on existing analytical data and the source locations of SP-4 material contents, it was determined that SP-4 required sampling for total uranium, technetium-99, and the same list of 12 organic WAC COCs used for SP-1. In addition, TCLP testing (for the contaminants listed in 40 CFR 261.24) was conducted due to existing data and the unknown origin of some materials in the stockpile.

The RSS measured surface total uranium concentration over 596 points, with results ranging from less than the MDC to 153.6 mg/kg. These results are summarized in Table 3-1 and the extent of RSS coverage is shown in Figure 3-5. No HPGe measurements were conducted.

Physical sample locations are shown on Figure 3-6 and laboratory results are summarized in Table 3-4. Results for total uranium analyses ranged from 3.38 mg/kg to 31.9 mg/kg. Technetium-99 analytical results ranged from non-detects less than 1 pCi/g to 1.3 pCi/g. All total and TCLP organic contaminant analyses were non-detect values (i.e., less than the EPA CLP CRDLs as listed in Table 3-4 for these constituents). TCLP inorganic results were all an order of magnitude less than the RCRA characteristic limits.

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3.4 CONCLUSIONS

From evaluation of the real-time and physical sample analytical results it can be concluded that material in SP-2, SP-4, and the eastern delineated portion of SP-1 is not RCRA characteristic and meets the WAC limits for placement in the OSDF.

The highest total uranium result was 217.5 mg/kg (measured using the RSS), less than one-fourth of the WAC limit of 1030 mg/kg. The highest total uranium result from physical sampling was 105 mg/kg, almost an order of magnitude less than the WAC limit. The highest technetium-99 result was 2.8 pCi/g, less than one-tenth of the WAC limit of 29.2 pCi/g. All total organic analyses resulted in non-detects at the EPA CLP CRDLs. TCLP testing of SP-1 and SP-4 resulted in no organic constituents detected and all inorganic values were an order of magnitude below the RCRA limits.

Based on this data it is concluded that material from SP-2, SP-4 and the eastern delineated portion of SP-1 qualifies for excavation and disposal in the OSDF.

12

TABLE 3-1
SUMMARY OF RSS TOTAL URANIUM REAL-TIME SCANNING RESULTS

No. of Measurement Points	MDC Range (mg/kg)	Result Range (mg/kg)	No. of Results > MDC
STOCKPILE 1			
844	74-252[a]	MDC-217.5	5
STOCKPILE 2			
409	75-138	MDC-188.8	58
STOCKPILE 4			
596	88-165[a]	MDC-153.6	2

[a] MDC values were elevated in some cases due to the effect of radiation from a nearby thorium storage facility.

TABLE 3-2
SUMMARY OF SP-1 PHYSICAL SAMPLING DATA

TOTAL URANIUM RESULTS

SP1-7	102 ppm	SP1-6	35.8 ppm
SP1-1	64.4 ppm	SP1-9	23.3 ppm
SP1-2	63.1 ppm	SP1-8	21.4 ppm
SP1-3	36.3 ppm	SP1-4	1.96 ppm
SP1-10	36.2 ppm	SP1-5	1.83 ppm

TECHNETIUM-99 RESULTS

SP1-7	2.8 pCi/g	SP1-2	1.3 pCi/g
SP1-1	2.3 pCi/g	SP1-4	<0.69 pCi/g
SP1-3	2.3 pCi/g	SP1-9	<0.46 pCi/g
SP1-10	1.8 pCi/g	SP1-5	<0.34 pCi/g
SP1-6	1.7 pCi/g	SP1-8	<0.14 pCi/g

TOTAL SVOC RESULTS
(based on results of 1 sample)

4-Nitroaniline	<820 μg/kg	Carbazole	<330 μg/kg
bis(2-Chloroisopropyl)ether	<330 μg/kg		

TOTAL PESTICIDE RESULTS
(based on results of 5 samples)

Alpha-chlordane	<1.7 μg/kg	Toxaphene	<67 μg/kg

TOTAL VOC RESULTS
(based on results of 5 samples)

1,1-Dichloroethene	<10 μg/kg	Tetrachloroethene	<10 μg/kg
1,2-Dichloroethene	<10 μg/kg	Trichloroethene	<10 μg/kg
Bromodichloroethane	<10 μg/kg	Vinyl Chloride	<10 μg/kg
Chloroethane	<10 μg/kg		

14

TABLE 3-2
SUMMARY OF SP-1 PHYSICAL SAMPLING DATA
(Continued)

TCLP RESULTS
(based on highest result of 5 samples)

Arsenic	<0.0335 mg/L	Heptachlor Epoxide	<0.0005 mg/L
Barium	1.26 mg/L	Hexachlorobutadiene	<0.05 mg/L
Benzene	<0.01 mg/L	Hexachloroethane	<0.05 mg/L
Cadmium	0.0028 mg/L	Lead	0.0406 mg/L
Carbon Tetrachloride	<0.005 mg/L	Lindane	<0.0005 mg/L
Chlordane	<0.005 mg/L	Mercury	<0.00002 mg/L
Chlorobenzene	<0.005 mg/L	Methoxychlor	<0.001 mg/L
Chloroform	<0.005 mg/L	2-Butanone	<0.02 mg/L
Chromium	0.0067 mg/L	Nitrobenzene	<0.05 mg/L
o-Cresol	<0.05 mg/L	Pentachlorophenol	<0.25 mg/L
m-Cresol	<0.05 mg/L	Pyridine	<0.05 mg/L
p-Cresol	<0.05 mg/L	Selenium	<0.028 mg/L
2,4-D	<0.04 mg/L	Silver	0.0058 mg/L
1,4-Dichlorobenzene	<0.05 mg/L	Tetrachloroethene	<0.005 mg/L
1,2-Dichloroethane	<0.005 mg/L	Toxaphene	<0.02 mg/L
1,1-Dichloroethene	<0.005 mg/L	2,4,5-TP (Silvex)	<0.01 mg/L
2,4-Dinitrotoluene	<0.05 mg/L	Trichloroethene	<0.01 mg/L
Endrin	<0.0005 mg/L	2,4,5-Trichlorophenol	<0.05 mg/L
Heptachlor	<0.0005 mg/L	2,4,6-Trichlorophenol	<0.05 mg/L
Hexachlorobenzene	<0.05 mg/L	Vinyl Chloride	<0.01 mg/L

2575

TABLE 3-3
SUMMARY OF SP-2 PHYSICAL SAMPLING DATA

TOTAL URANIUM RESULTS

SP2-2	105 ppm	SP2-6	43.5 ppm
SP2-9	60.5 ppm	SP2-4	39.3 ppm
SP2-3	53.2 ppm	SP2-1	36.8 ppm
SP2-10	52.3 ppm	SP2-7	31.2 ppm
SP2-5	43.6 ppm	SP2-8	30.7 ppm

TECHNETIUM-99 RESULTS

SP2-4	<0.86 pCi/g	SP2-10	<0.50 pCi/g
SP2-6	<0.84 pCi/g	SP2-3	<0.43 pCi/g
SP2-2	<0.78 pCi/g	SP2-1	<0.32 pCi/g
SP2-9	<0.75 pCi/g	SP2-8	<0.05 pCi/g
SP2-7	<0.67 pCi/g	SP2-5	<0.01 pCi/g

TOTAL SVOC RESULTS (based on results of 1 sample)

4-Nitroaniline	<820 μg/kg	Carbazole	43 μg/kg*
bis(2-Chloroisopropyl)ether	<330 μg/kg		

* The EPA CRDL for Carbazole is 330 μg/kg

16

TABLE 3-4
SUMMARY OF SP-4 PHYSICAL SAMPLING DATA

TOTAL URANIUM RESULTS

SP4-10	31.9 ppm	SP4-1	13.6 ppm
SP4-3	18.4 ppm	SP4-8	12.4 ppm
SP4-9	16.0 ppm	SP4-5	11.9 ppm
SP4-7	15.2 ppm	SP4-2	9.80 ppm
SP4-6	14.8 ppm	SP4-4	3.38 ppm

TECHNETIUM-99 RESULTS

SP4-3	1.3 pCi/g	SP4-4	<0.54 pCi/g
SP4-1	<0.91 pCi/g	SP4-8	<0.35 pCi/g
SP4-7	<0.65 pCi/g	SP4-2	<0.26 pCi/g
SP4-6	<0.64 pCi/g	SP4-9	<0.16 pCi/g
SP4-10	<0.61 pCi/g	SP4-5	<0.15 pCi/g

TOTAL SVOC RESULTS
(based on results of 1 sample)

4-Nitroaniline	<820 μg/kg	Carbazole	<330 μg/kg
bis(2-Chloroisopropyl)ether	<330 μg/kg		

TOTAL PESTICIDE RESULTS
(based on results of 5 samples)

Alpha-chlordane	<1.7 μg/kg	Toxaphene	<67 μg/kg

TOTAL VOC RESULTS
(based on results of 5 samples)

1,1-Dichloroethene	<10 μg/kg	Tetrachloroethene	<10 μg/kg
1,2-Dichloroethene	<10 μg/kg	Trichloroethene	<10 μg/kg
Bromodichloroethane	<10 μg/kg	Vinyl Chloride	<10 μg/kg
Chloroethane	<10 μg/kg		

2575

TABLE 3-4
SUMMARY OF SP-4 PHYSICAL SAMPLING DATA
(Continued)
TCLP RESULTS
(based on highest result of 5 samples)

Arsenic	<0.0335 mg/L	Heptachlor Epoxide	<0.00025 mg/L
Barium	4.44 mg/L	Hexachlorobutadiene	<0.05 mg/L
Benzene	<0.005 mg/L	Hexachloroethane	<0.05 mg/L
Cadmium	0.005 mg/L	Lead	<0.0276 mg/L
Carbon Tetrachloride	<0.005 mg/L	Lindane	<0.00025 mg/L
Chlordane	<0.0025 mg/L	Mercury	<0.00002 mg/L
Chlorobenzene	<0.005 mg/L	Methoxychlor	<0.0005 mg/L
Chloroform	<0.005 mg/L	2-Butanone	<0.02 mg/L
Chromium	0.009 mg/L	Nitrobenzene	<0.05 mg/L
o-Cresol	<0.05 mg/L	Pentachlorophenol	<0.25 mg/L
m-Cresol	<0.05 mg/L	Pyridine	<0.05 mg/L
p-Cresol	<0.05 mg/L	Selenium	<0.028 mg/L
2,4-D*	<0.04 mg/L	Silver	0.0081 mg/L
1,4-Dichlorobenzene	<0.05 mg/L	Tetrachloroethene	<0.005 mg/L
1,2-Dichloroethane	<0.005 mg/L	Toxaphene	<0.01 mg/L
1,1-Dichloroethene	<0.005 mg/L	2,4,5-TP (Silvex)*	<0.01 mg/L
2,4-Dinitrotoluene	<0.05 mg/L	Trichloroethene	<0.005 mg/L
Endrin	<0.00025 mg/L	2,4,5-Trichlorophenol	<0.05 mg/L
Heptachlor	<0.00025 mg/L	2,4,6-Trichlorophenol	<0.05 mg/L
Hexachlorobenzene	<0.05 mg/L	Vinyl Chloride	<0.01 mg/L

* Based on highest result of 4 samples

18

-- 2575

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U.S. Department of Energy, 1998, "WAC Attainment Plan for the On-Site Disposal Facility," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1999, "Project Specific Plan for Sampling of Removal Action 17 Stockpiles 1, 2, and 4 for OSDF WAC Attainment," Revision 0, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

19

APPENDIX A

PROJECT SPECIFIC PLAN FOR SAMPLING OF REMOVAL ACTION 17 STOCKPILES 1, 2, AND 4 FOR OSDF WAC ATTAINMENT AND ASSOCIATED VARIANCE/FIELD CHANGE NOTICES

-- 2575

PROJECT SPECIFIC PLAN FOR SAMPLING OF REMOVAL ACTION 17 STOCKPILES 1, 2, AND 4 FOR OSDF WAC ATTAINMENT

SOIL CHARACTERIZATION AND EXCAVATION PROJECT

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

APRIL 1999

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

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21

-- 2575

PROJECT SPECIFIC PLAN FOR SAMPLING OF REMOVAL ACTION 17 STOCKPILES 1, 2, AND 4 FOR OSDF WAC ATTAINMENT

20200-PSP-0003
Revision 0

April 30, 1999

APPROVAL:

for Rich Abitz, Production Area Project Manager — Date
Soil Characterization and Excavation Project

C.M. Messerly — 4/30/99
Christine Messerly, Production Area Characterization Lead — Date
Soil Characterization and Excavation Project

Vicky Zimmerman — 4/30/99
Vicky Zimmerman, Sampling and Analysis Manager — Date
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Frank Thompson — 5-3-99
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22

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

ASL	analytical support level
ccpm	corrected counts per minute
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COCs	constituents of concern
DQO	Data Quality Objective
EP Tox	Extraction Procedure Toxicity
FACTS	Fernald Analytical Customer Tracking System
GPC	Gas Proportional Count
GPS	Global Positioning System
HPGe	high-purity germanium
ICP/MS	Inductively Coupled Plasma/Mass Spectroscopy
IDW	Investigation Derived Waste
mg/kg	milligram per kilogram
mg/L	milligrams/liter
mL	milliliter
MTL	Material Tracking Location
NaI	sodium iodide
OSDF	On-Site Disposal Facility
pCi/g	picocurie per gram
PID	photoionization detector
ppm	parts per million
PQL	practical quantitation limit
PSP	Project Specific Plan
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RMS	Radiation Measurement System
RSS	Radiation Scanning System
RTRAK	Real Time Radiation Tracking System
RWP	Radiological Work Permit
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SP-1	Removal Action 17 Stockpile #1
SP-2	Removal Action 17 Stockpile #2
SP-4	Removal Action 17 Stockpile #4
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
μg/kg	micrograms per kilogram
UST	Underground Storage Tank
V/FCN	Variance/Field Change Notice
VOC	volatile organic compound
WAC	waste acceptance criteria
WAO	Waste Acceptance Organization

1.0 INTRODUCTION

1.1 PURPOSE

This project specific plan (PSP) has been developed to evaluate attainment of the On-Site Disposal Facility (OSDF) waste acceptance criteria (WAC) for soil contained in Removal Action 17 Stockpile #1 (SP-1), Removal Action 17 Stockpile #2 (SP-2), and Removal Action 17 Stockpile #4 (SP-4), as required by the Sitewide Excavation Plan (SEP, DOE 1998a) and the WAC Attainment Plan for the OSDF (DOE 1998b). The stockpile locations are shown on Figure 1-1. The sampling strategy presented in this PSP includes random and biased physical sampling throughout the stockpiles and real-time gamma spectrometry measurements over the stockpile surfaces.

SP-1, SP-2, and SP-4 are currently planned to be excavated between April 2000 and December 2000. WAC attainment characterization is necessary at this time to allow data to be evaluated and the excavation monitoring PSP for each stockpile to be developed. SP-2 may be excavated as early as September 1999 for use in testing the Segmented Gate System, a technology that will segregate above-WAC soil from below-WAC soil using real-time gamma detectors. This test would be the subject of a separate plan.

This PSP fulfills the requirements of the SEP and the WAC Attainment Plan for the OSDF for developing predesign investigation plans and for documenting the justification for selection of stockpile-specific WAC constituents of concern (COCs). The data generated under this PSP will be used to 1) demonstrate that soil meeting the OSDF WAC may be bulk excavated and placed in the OSDF, 2) identify areas of soil which exceed the OSDF WAC, if any, and 3) apply the excavation approach to the stockpiles.

1.2 STOCKPILE HISTORY AND DETERMINATION OF WAC COCs

Each stockpile was created with material from different sources. Subsequently, the histories and determinations of WAC COCs are presented separately for each stockpile.

1.2.1 SP-1 History

SP-1 [Material Tracking Location (MTL) W800051] is located in the northern portion of the Former Production Area, south of the OSDF Haul Road, west of the Decontamination Pad, and east of SP-4 (see Figure 1-1). It consists of approximately 1,500 cubic yards of soil and 500 cubic yards of debris. SP-1 is divided into distinct western and eastern portions. The western portion was created in 1997 by the consolidation of soil generated during OSDF Haul Road construction. This portion will not be sampled at this time and will remain open to accept future excess soil. The western portion will be sampled for OSDF WAC attainment at a later date. The eastern portion is a radiologically controlled area and was created by the consolidation of excess soil and debris generated by the following projects:

- Plant 1 Pad Upgrade (Phases A and B)
- Addition to Plant 5 Derby Slag Operation
- Lab addition
- Plants 4, 6, and 8 Warehouses construction
- Maintenance Building Warehouse construction
- Plant 8 addition
- Underground utilities maintenance projects
- Investigation Derived Waste (IDW) drum waste consolidation.

Soil generation by these activities began in 1988, and SP-1 was officially designated in 1991 as part of Removal Action 17. Most of these construction activities took place in or near the Former Production Area. The precise origin of the IDW that was consolidated in SP-1 is not known; however, it is known that the IDW came from both inside and outside the Former Production Area. SP-1 is currently active; following this sampling event, only the western portion will be available for material placement.

The eastern and western portions of SP-1 are separated by construction fence, radiological control rope, and signs stating that entry to the eastern portion is only allowed with an approved Radiological Work Permit (RWP). In addition, the entire stockpile is surrounded by a locked chain-link fence. In order to minimize cross-contamination between the two sides of the pile, silt fence will be installed at the top of the slope to the west of the east/west dividing line. When sampling of the west side of the stockpile is performed, biased samples will be located along the dividing line to confirm that no above-WAC soil has contaminated the eastern portion of the stockpile. Weekly inspections of the stockpile and silt fence will be performed in accordance with procedure EW-1023, *Management of Stockpiles*, and a work order will be put in place to correct any problems that are identified. The silt fence, combined with weekly inspections and the fact that the western portion of the stockpile has a

good vegetative cover on it already, will minimize cross-contamination between the two sides of the stockpile.

1.2.2 Determination of SP-1 WAC COCs

1.2.2.1 Existing Data

The existing data on SP-1 were collected in 1994 from soil that was removed during the construction of the Maintenance Building Warehouse. Thirteen samples were collected and analyzed for radionuclides, total metals, and by the toxicity characteristic leaching procedure (TCLP) for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and herbicides. All TCLP results were either nondetects or were below the TCLP regulatory limit, total metal results were less than 20 times the TCLP limit, and total uranium concentrations ranged from 11.5 to 98.8 milligrams per kilogram (mg/kg). These data are presented in Appendix D.

1.2.2.2 COCs

The OSDF WAC Attainment Plan requires that all 18 WAC COCs and Resource Conservation and Recovery Act (RCRA) toxicity characteristic COCs be considered when sampling is conducted on stockpiles with material of unknown origin, such as the IDW material. The following discussion evaluates these constituents and proposes the final list of WAC attainment COCs for SP-1, which are summarized in Table 1-1.

Radionuclides

Radionuclide WAC COCs for the OSDF are total uranium, technetium-99, neptunium-237, and strontium-90. Above-WAC concentrations of total uranium and technetium-99 have been detected in many areas of the site, and therefore are WAC COCs for SP-1. The OSDF WAC limits for neptunium-237 and strontium-90, however, are much higher than detected concentrations at the site. The WAC for neptunium-237 is 3.12×10^9 picocuries per gram (pCi/g), while the highest soil activity measured on site for neptunium-237 is 37.2 pCi/g. Similarly, the WAC for strontium-90 is 5.67×10^{10} pCi/g, while the highest soil activity measured on site for strontium-90 is 47.6 pCi/g. Therefore, neptunium-237 and strontium-90 will not be WAC COCs for SP-1.

Organics

OSDF WAC were established for 12 organic compounds, including VOCs, SVOCs, and pesticides. One VOC (chloroethane) and one pesticide (toxaphene) have WAC limits that are significantly higher than the highest concentrations detected on site (2,600 mg/kg maximum detected concentration versus a 3.92×10^5 WAC limit for chloroethane and 10 mg/kg maximum detected concentration versus a 1.06×10^5 WAC limit for toxaphene). These compounds are not expected to be present in SP-1 at levels that approach the established WAC. However, because the origin of the IDW material in SP-1 is not known, the other VOCs and pesticide will be WAC COCs for the stockpile and analysis of chloroethane and toxaphene will not result in added laboratory costs. Therefore, they will be included in the list of WAC COCs for SP-1.

Of the three SVOCs, carbazole has a WAC limit significantly higher than the highest concentrations detected on site. The highest on-site concentration of carbazole is 89 mg/kg, while the WAC limit is 7.27×10^4 mg/kg. The other two SVOCs, bis(2-chloroisopropyl)ether and 4-nitroaniline, have no history of use during site operations. The single detection for 4-nitroaniline and the two positive detections of bis(2-chloroisopropyl)ether are all estimated values based on the results being near or below the practical quantitation limit (PQL). During previous laboratory analyses, the laboratories' PQL for 4-nitroaniline and bis(2-chloroisopropyl)ether was well above the WAC established for these two compounds. Therefore, 4-nitroaniline and bis(2-chloroisopropyl)ether will be retained as WAC COCs for SP-1 using the EPA Contract Laboratory Program Contract Required Detection Limits of 830 micrograms per kilogram (μg/kg) and 330 μg/kg, respectively, as default WAC attainment values since it is not feasible with current analytical methods to achieve detection limits at the WAC established for these two constituents. Because carbazole is not expected at levels that approach the established WAC and because the number of estimated detections reported for bis(2-chloroisopropyl)ether and 4-nitroaniline comprise less than 1 percent of the total number of samples analyzed to date, the number of samples analyzed for these SVOCs under this PSP will be limited.

The following is the list of organic WAC COCs for SP-1:

- alpha-chlordane
- bromodichloromethane
- 1,1-dichloroethene
- toxaphene
- chloroethane
- 1,2-dichloroethene

- tetrachloroethene
- vinyl chloride
- bis(2-chloroisopropyl)ether
- trichloroethene
- carbazole
- 4-nitroaniline

Metals

OSDF WAC were established for total boron and mercury; WAC were not established for any other non-radionuclide metals. Boron and mercury have not been detected on site at concentrations near the OSDF WAC limits. The highest on-site concentration of total boron is 36 mg/kg, while the WAC is 1,040 mg/kg, and the highest on-site concentration of total mercury is 130.9 mg/kg, while the WAC is 56,600 mg/kg. Because the highest site concentrations are at least two orders of magnitude lower than the OSDF WAC limits, these metals will not be WAC COCs for SP-1.

Characteristic Hazardous Constituents

Construction of the Maintenance Building Warehouse, which contributed soil to SP-1, took place near the potential RCRA characteristic area located north of the Maintenance Building. This area was identified as potentially characteristic because of elevated concentrations of trichloroethene and lead. Although soil samples from this area that were collected from SP-1 passed TCLP analysis, more recent predesign characterization results indicate that this area does contain soil contaminated with trichloroethene at levels significantly above the TCLP limit. In addition, the origin of the IDW material is unknown. Therefore, TCLP testing for the full toxicity characteristic list will be included in the WAC attainment sampling for SP-1.

1.2.3 SP-2 History

SP-2 (MTL W800052) is located in the northwest corner of the Former Production Area, east of the Solid Waste Landfill and north of Stockpile 7 (see Figure 1-1). It consists of approximately 2,000 cubic yards of soil and 300 cubic yards of debris. SP-2 was created by the consolidation of excess soil and debris generated by the following projects:

- Building 78 Construction Project
- East Street Road Construction Project
- Storm Sewer Repair Project and Utilities Upgrade Project in Plant 8 area
- Plant 5 Duplex Office Installation Project
- K-65 Area Storm Water Run-Off Control Project
- Storm Sewer Repair Project and Utilities Upgrade Project in the K-65 Area.

30

Research indicates that these projects were completed between 1988 and 1993. The first four projects were completed in the Former Production Area; the last two projects were completed in the K-65 Area. SP-2 is not currently active; no additional material may be placed in the stockpile.

1.2.4 Determination of SP-2 WAC COCs

The material placed into SP-2 originated from the Former Production Area and the K-65 area. The following discussion on existing sample data from the stockpile examines these two site areas as well as data collected directly from material placed in SP-2. The WAC COCs for SP-2 are summarized in Table 1-1.

1.2.4.1 Existing Data

Former Production Area

In the Former Production Area, five of the 18 OSDF WAC constituents were detected at above-WAC concentrations or have above-WAC analytical detection limits:

- total uranium
- technetium-99
- bis(2-chloroisopropyl)ether
- 4-nitroaniline
- trichloroethene.

K-65 Area

In the K-65 area (Remediation Area 7), only four of the 18 WAC constituents were detected at above-WAC concentrations or have above-WAC analytical detection limits:

- total uranium
- technetium-99
- bis(2-chloroisopropyl)ether
- 4-nitroaniline.

SP-2 Data

Existing analytical data on SP-2 are from samples collected from the 12 temporary soil stockpiles generated within the Former Production Area during the Building 78 construction project and East Street road construction project. Fifty-six soil samples were analyzed for various combinations of radionuclides and TCLP for VOCs, SVOCs, and metals. All TCLP results were either nondetects or below the TCLP regulatory limit and total uranium concentrations ranged from less than 11 (nondetect)

to 154 mg/kg. These data are presented in Appendix D. No samples were collected from the other material that was placed in SP-2 or collected directly from SP-2.

1.2.4.2 COCs

Unlike SP-1 and SP-4, SP-2 does not contain material with an unknown origin. Based on the existing data for the material in SP-2, the constituents to be evaluated for the final list of WAC COCs are total uranium, technetium-99, bis(2-chloroisopropyl)ether, 4-nitroaniline, trichloroethene, and TCLP analysis.

Radionuclides

Total uranium and technetium-99 have been detected above the WAC in both the Former Production Area and the K-65 Area, and therefore are WAC COCs for SP-2.

Organics

Bis(2-chloroisopropyl)ether and 4-nitroaniline are retained as WAC COCs for SP-2 but with limited analysis as described above.

Trichloroethene was detected above the WAC only once out of 1,086 samples collected sitewide. This sample was collected from a soil boring located north of the Maintenance Building. The material deposited in SP-2 did not originate from this area. Therefore, trichloroethene was removed from the list of WAC COCs for SP-2.

Characteristic Hazardous Constituents

A portion of the East Street Road Construction Project took place near a potential RCRA characteristic area containing soil with elevated lead concentrations (the Scrap Metal Pile area). Ten of the twelve temporary stockpiles that were created during the Building 78 Construction Project and East Street Road Construction Project were sampled and analyzed for TCLP metals. Lead concentrations were more than one order of magnitude below the TCLP limit of 5.0 milligrams/liter (mg/L).

The Storm Sewer Repair Project and Utilities Upgrade Project in Plant 8 area and the Plant 5 Duplex Office Installation Project were not conducted near any potential RCRA characteristic areas.

Although potential RCRA characteristic material (chromium and lead) was previously located on the bank of Paddys Run to the west of the K-65 Silos, 25 samples recently collected during WAC attainment sampling for Area 7 demonstrate that lead and chromium are not present at characteristic concentrations (20 times the TCLP limit). The maximum concentration reported for chromium is 20.4 mg/kg and the maximum concentration for lead is 34.7 mg/kg; the 20-times concentration for both constituents is 100 mg/kg. Therefore, due to the existing data on SP-2 and process knowledge of the stockpile, TCLP testing will not be conducted on samples collected from SP-2.

1.2.5 SP-4 History

SP-4 (MTL W800054) is located in the northern portion of the Former Production Area, south of the OSDF Haul Road, and west of SP-1 (see Figure 1-1). It consists of approximately 2,200 cubic yards of soil and 400 cubic yards of debris. SP-4 was created by the consolidation of excess soil and debris generated during sitewide underground storage tank (UST) removals and from sitewide fuel spill cleanups.

Soil generation by these activities began in 1990. Most of the UST removal activities took place in or near the Former Production Area. The precise origin of the soil from sitewide spill cleanups is not known. SP-4 is currently an active stockpile; however, no additional material will be added following sample collection.

1.2.6 Determination of SP-4 WAC COCs

1.2.6.1 Existing Data

Analytical results for samples collected from soil excavated during UST removal are summarized in Table 2-2 of the SEP. This table is included in Appendix D of this PSP. The results indicate that WAC COCs in material placed into SP-4, with the exception of one sample from the excavation of UST #17, are below the OSDF WAC limits. The sample from the UST #17 excavation exceeded the RCRA characteristic limit for chromium [sample result from the Extraction Procedure Toxicity (EP Tox) method was 12.9 mg/L versus the EP Tox limit of 5.0 mg/L; the EP Tox limit is equivalent to the TCLP limit]. The WAC COCs for SP-4 are summarized in Table 1-1.

Ten samples were collected from SP-4 in 1993 and analyzed for various combinations of radionuclides, organics, and metals. Results indicate that the concentration of total uranium is less than 11 mg/kg

(nondetect in all analyzed samples), total mercury concentrations meet the WAC and are less than 20 times the TCLP limit in all cases, and the two organic WAC COCs analyzed (trichloroethene and tetrachloroethene) are nondetects that are less than 20 times the TCLP limit. Ten additional samples were collected from SP-4 in 1995 and analyzed for VOCs. Results for trichloroethene and tetrachloroethene (the only two WAC COCs analyzed) are nondetects that are less than 20 times the TCLP limit.

1.2.6.2 COCs

The OSDF WAC Attainment Plan requires that all 18 WAC COCs and RCRA toxicity characteristic COCs be considered when sampling is conducted on stockpiles with material of unknown origin, such as the soil from sitewide spill cleanups. The following discussion evaluates these constituents and proposes the final list of WAC attainment COCs for SP-4.

Radionuclides

Radionuclide WAC COCs for the OSDF are total uranium, technetium-99, neptunium-237, and strontium-90. Total uranium and technetium-99 have been detected above the WAC in many areas of the site, and therefore are WAC COCs for SP-4. Neptunium-237 and strontium-90 are eliminated as WAC COCs for SP-4 for the same reason they were eliminated for SP-1 (see Section 1.2.2).

Organics

Because the origin of the spill cleanup material in SP-4 is not known, SP-4 will have the same list of organic WAC COCs as SP-1 (see Section 1.2.2 and Table 1-1).

Metals

OSDF WAC were established for boron and mercury. Boron and mercury are eliminated as WAC COCs for SP-4 for the same reason they were eliminated for SP-1 (see Section 1.2.2).

Characteristic Hazardous Constituents

Because the precise origin of the soil from sitewide spill cleanups is not known, and because the EP Tox chromium result from UST #17 exceeds the toxicity characteristic limit, it is possible that characteristic hazardous soil is present in SP-4. Therefore, TCLP analysis for the full toxicity characteristic list will be conducted on samples collected from SP-4.

34

1.3 SCOPE

Under this PSP, real-time and physical sampling will be performed on SP-1, SP-2, and SP-4 to identify and bound soil with contaminant concentrations above the OSDF WAC. Following review of the sample results, additional samples may be collected beyond those identified in this PSP if the extent of above-WAC material has not been adequately bound. In this situation, a variance to this PSP will be written. Sampling activities carried out under this PSP will be performed in accordance with the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ), the SEP, the WAC Attainment Plan for the OSDF, and Data Quality Objectives (DQO) SL-048, Rev. 5 (see Appendix A), and DQO SL-053, Rev. 0 (see Appendix A).

Design of the excavations for SP-1, SP-2, and SP-4 is not included in the scope of this PSP.

1.4 KEY PROJECT PERSONNEL

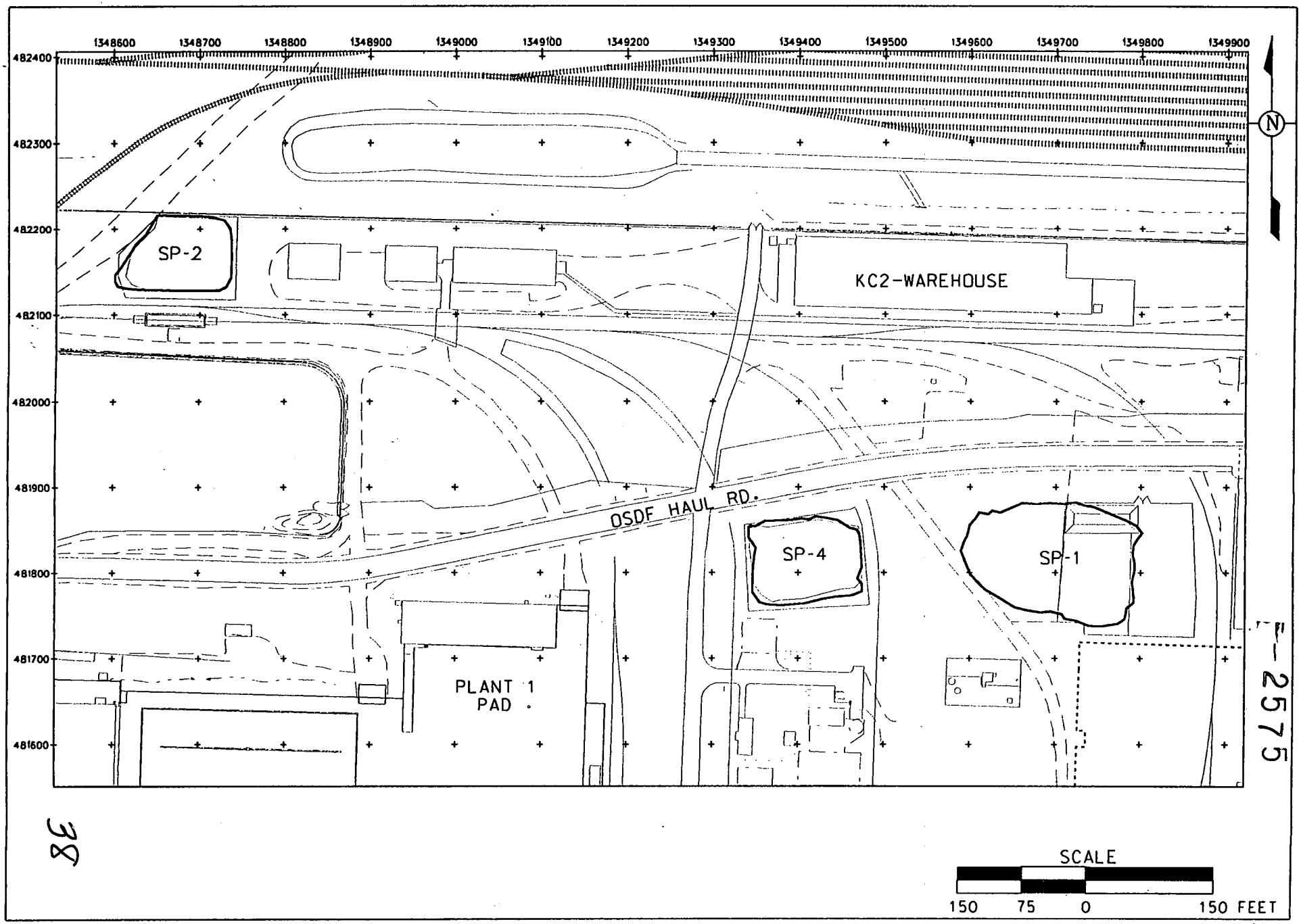
The team members responsible for coordination of work in accordance with this PSP are listed in Table 1-2.

TABLE 1-1
WAC COCs FOR SP-1, SP-2, AND SP-4

SP-1	SP-2	SP-4
total uranium	total uranium	total uranium
technetium-99	technetium-99	technetium-99
alpha-chlordane	bis(2-chloroisopropyl)ether	alpha-chlordane
toxaphene	4-nitroaniline	toxaphene
bromodichloromethane		bromodichloromethane
chloroethane		chloroethane
1,1-dichloroethene		1,1-dichloroethene
1,2-dichloroethene		1,2-dichloroethene
tetrachloroethene		tetrachloroethene
trichloroethene		trichloroethene
vinyl chloride		vinyl chloride
carbazole		carbazole
bis(2-chloroisopropyl)ether		bis(2-chloroisopropyl)ether
4-nitroaniline		4-nitroaniline
TCLP (VOCs, SVOCs, pesticides, herbicides, metals)		TCLP (VOCs, SVOCs, pesticides, herbicides, metals)

TABLE 1-2
KEY PERSONNEL

Title	Primary	Alternate
DOE Contact	Rob Janke	Kathi Nickel
Area 3 Project Manager	Rich Abitz	Jyh-Dong Chiou
Area 3 Characterization Lead	Christine Messerly	Rich Abitz
Real-Time Characterization Lead	Dave Allen	Joan White
Field Sampling Lead	Mike Frank	Tom Buhrlage
Surveying Lead	Jim Schwing	Jim Capannari
WAO Stockpile Contact	Dale Weber	Linda Barlow
FEMP Sample Management Office Contact	Bill Westerman	Jenny Vance
Data Management Lead	Christine Messerly	Rich Abitz
Data Validation Contact	Jenine Rogers	Jim Cross
Quality Assurance Contact	Reinhard Friske	Ervin O'Bryan
Health and Safety Contact	Debbie Grant	Lewis Wiedeman



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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 1-1. LOCATION OF STOCKPILES SP-1, SP-2, AND SP-4

01-MAR-1999

2.0 SAMPLING STRATEGY

2.1 DETERMINATION OF NUMBER OF SAMPLES

In accordance with the SEP and OSDF WAC Attainment Plan, the number of samples determined to adequately characterize SP-1, SP-2, and SP-4 is collectively based on the current data set, the Remedial Investigation/Feasibility Study (RI/FS) sampling density in the Former Production Area, process knowledge of the stockpiles, and sampling density in previous soil stockpile sampling projects. Based on these requirements, 10 samples will be collected from each stockpile.

Based on previous stockpile sampling projects, an analytical frequency has been established for the WAC COCs. All the random samples from each stockpile will be analyzed for total uranium and technetium-99. Fifty percent of the samples from SP-1 and SP-4 (five from each stockpile) will be analyzed for VOCs, pesticides, and full TCLP. Ten percent of the samples from SP-1, SP-2, and SP-4 (one from each stockpile) will be analyzed for SVOCs. The sample locations for the non-radiological analyses were randomly selected.

The sample density for SP-1, SP-2, and SP-4 translates to an average of 1 sample per 230 cubic yards, which is a higher density relative to the WAC attainment sampling activities performed for the Area 1, Phase I West Impacted Soil Stockpile (DOE 1998c) (1 sample per 420 cubic yards) and SP-5 (DOE 1998d) (1 sample per 350 cubic yards).

2.2 SELECTION OF SAMPLE LOCATIONS

Sample locations and depths are based on both a combination of systematic grid/random approach and biased sampling at the random boring locations. At least 30 samples will be collected through this integrated sampling strategy for each stockpile; other samples may be collected from the soil cores, depending on field beta/gamma and photoionization detector (PID) readings. A contingency plan to collect additional surface soil samples based on scans by the sodium iodide (NaI) and high-purity germanium (HPGe) detector systems has also been developed (see Section 3.0).

A systematic approach was used to establish a sample grid over the stockpile surface. The grid pattern was based on surface area and consists of 10 grid blocks of approximately equal size for each stockpile. A random sample location (northing and easting coordinate) was selected within each block as shown

on Figures 2-1 through 2-3. Depth intervals were randomly selected at each sampling location. Alternate random depths were also selected in case of refusal at some boring locations. The random sample depth intervals are presented in Appendix C. If a boring has to be relocated prior to sampling, the sample depth interval(s) will be recalculated based on the pile height at the new location. Sampling locations will be surveyed (northing, easting, and height) and that information will be recorded.

2.3 SAMPLE COLLECTION METHODS

Samples will be collected using the Geoprobe® Model 5400 in accordance with procedure EQT-06, *Geoprobe® Model 5400 - Operation and Maintenance*, where locations support the safe operation of the Geoprobe® vehicle. Otherwise, hand augering or direct-push liner sampling will be conducted, in accordance with procedure SMPL-01, *Solids Sampling*. At each sampling location, the surface vegetation within a 6-inch radius of the sample point will be removed using a stainless steel trowel or by hand with clean nitrile gloves while taking care to minimize the removal of any soil.

Random soil samples will be collected from the 1.5-foot intervals identified in Appendix C. If the stockpile height at the sample location is less than 1.5 feet, the maximum possible interval depth was specified in Appendix C. If additional volume is necessary, additional cores will be collected. The sample depth intervals will be recorded on the appropriate field documentation.

All borings will be completed to the base of the pile for field screening purposes. If refusal or resistance is encountered during the soil borings, up to two additional borings within a 3-foot radius of the original point will be attempted to collect the specified samples. If this is necessary, borings will not be moved across grid lines. If the primary random depth cannot be collected and the alternate random depth is shallower and has already been discarded, the alternate random depth interval will be collected from any additional borings attempted. If there is no recovery at the sample interval specified in Appendix C, the interval directly above or below may be used without a variance to this PSP. All encounters with subsurface debris will be noted in the field log in order to characterize the pile for debris content. Disposition of excess soil and decontamination water will be determined by the Field Sampling Lead and the Waste Acceptance Organization (WAO) Excavation Project Lead.

2.3.1 Geoprobe® Methods

A Geoprobe® Macro-Core sampler will be advanced in approximately 12-48 inch increments to collect the target depth intervals for the soil samples specified in Appendix C. The Macro-Core collects a 1.5-inch diameter soil core. Multiple cores may be collected at each sampling location (not to exceed 1 foot apart) to obtain sufficient sample volume for analysis if complete sample recovery is not obtained. Borehole collapse will be monitored during core sampling to ensure minor sidewall slough is accounted for during coring and sample collection. If significant borehole collapse occurs, a closed-tube, piston-type core sampler (Macro-Core) will be employed which is closed during advancement to the sample interval, then opened to collect the discrete interval of interest. The Macro-Core sampling method will utilize a disposable plastic liner insert in which the soil core is recovered.

2.3.2 Manual Sampling Methods

If Geoprobe® accessibility is not possible, soil samples will be collected using a hand auger (typically 3-inch diameter) or other methods in specified in SMPL-01, *Solids Sampling*. The hand auger will be advanced in approximately 6-inch increments down to the target depth intervals for the soil samples specified in Appendix C. As with core sampling, multiple holes at one sampling location (not to exceed 1 foot apart) may have to be augered to obtain sufficient volume for laboratory analysis. Borehole collapse will be monitored during core sampling to ensure sidewall slough is accounted for during augering and sample collection. The borehole will be manually collapsed following sample collection to eliminate the possibility of injury to workers. For surface samples, a direct-push liner (6-inch length) may be used to collect the samples from the 0-6 inch interval. Surface samples may be required as a result of real-time radiological scanning, as discussed in Section 3.0.

2.3.3 Biased Sample Selection

Each boring location will be screened for VOCs using a PID and radiologically screened using a beta/gamma (Geiger-Mueller) survey meter. Any concrete and debris will be removed from the samples to the extent practical prior to screening.

The entire length of each boring will be screened using a PID. For hand auger borings, each 6-inch push will be placed in a tray prior to PID screening. For Geoprobe® cores, the core liners will be opened for PID screening. Any 6-inch interval with an above-background reading on the PID will be

subjected to a headspace analysis, in accordance with procedure EQT-04, *Photoionization Detector*. Headspace analysis involves placing a small amount of soil into a sample container, covering the container opening with aluminum foil, placing the lid on the container, and placing it in an area where the temperature is greater than 60°F for five to ten minutes. The container lid is then removed, the PID tip inserted through the aluminum foil, and a PID measurement collected for ten seconds. The sample measurement will be recorded on the Field Activity Log. If the result of the headspace analysis is above 10 ppm, the 6-inch sample interval will be submitted for total VOC analysis. If the entire boring is below background on the initial PID screening or if all headspace analysis results are less than 10 ppm, no biased sample will be collected from that boring.

The entire length of the soil core, or the cuttings in the case of augering, will be surveyed to determine the intervals with beta/gamma readings above 450 corrected counts per minute (ccpm). The identified 6-inch intervals will be sampled and analyzed for total uranium only. If the entire soil core is found to be less than 450 ccpm, then no high-biased sample will be collected from that boring. Archive samples will be collected from the 6-inch intervals above and below any sample intervals that are above 450 ccpm. If the interval above or below is already designated for sampling, then no additional archive sample will be necessary in that direction. In the event that biased sample intervals are above the total uranium WAC, the archive samples may be submitted for analysis in an attempt to vertically bound the contamination.

2.3.4 Soil Sample Processing and Analysis

The Geoprobe® soil cores will be laid out on clean plastic, and the appropriate sample intervals, as defined in Appendix C or identified in the VOC and radiological screening, will be separated from the core to obtain the necessary samples. Any debris (e.g., wood, concrete, metal) contained in a sample interval will be removed from the sample in the field. For hand augering sampling locations, the soil cuttings collected from the target sample interval will be placed in a clean tray prior to transfer to a sample container so that the interval can be screened with a PID as described in Section 2.3.3. VOC samples from hand augering locations will be immediately placed in the sample container following screening. Sample volume and analysis information is summarized in Table 2-1.

Samples being analyzed for radiological constituents and TCLP metals will be sent to the on-site laboratory for analysis. The VOC, SVOC, pesticide, TCLP VOC, and TCLP SVOC/pesticide/

herbicide samples will be sent to the Sample Processing Laboratory, where they will be prepared for shipment to an approved off-site laboratory in accordance with S.P. 766-S-1000, *Shipping Samples to Off-Site Laboratories*. One alpha/beta screening sample will be collected and analyzed on site for each location with samples being sent off site for analysis. The laboratories will analyze the samples for the appropriate Target Analyte List (TAL), as identified in Appendix B.

2.4 SAMPLE IDENTIFICATION

All physical soil samples collected for laboratory analysis will be assigned a unique sample identifier, as listed in Appendix C. This identifier will consist of a prefix designating the area name (SP1, SP2, or SP4), followed by the sample point number (1 through 10), followed by a letter designating the type of sample ("R" for radionuclides, "L" for VOCs, "S" for SVOCs, "P" for pesticides, "TL" for TCLP VOC, "TS" for TCLP SVOC, pesticide, and herbicide, "TM" for TCLP metals, and "AB" for alpha/beta). For example:

> SP4-2-P is the sample collected at sample point 2 in SP-4 and is being analyzed for pesticides.

Biased samples collected as a result of PID and beta/gamma surveys will have a "B" followed by a sequential number 1 through x inserted after the sample point number. For example:

> SP4-2-B3-R is the third biased sample collected at sample point 2 in SP-4 and is being analyzed for radionuclides.

Any archive samples collected will be assigned a "V" suffix (e.g., SP4-2-B3-R-V) to designate an archive. Trip blanks will be labeled with the area name and the suffix "TB." For example, SP4-TB2 is the second trip blank from SP-4.

If a boring location requires multiple borings due to subsurface refusal, or if a boring is moved after attempting the original location, the boring grid identifier will be designated with an alphabetic suffix (e.g., 7A, 7B, etc.) Therefore, a random sample collected during the third attempt at sample point 2 at SP-4 would be SP4-2C-R.

2.5 EQUIPMENT DECONTAMINATION

Sampling equipment will be decontaminated before transport to the sampling site. Additionally, equipment that comes into contact with sample media at the target sample interval must be

decontaminated, including the core sampler cutting shoe, hand auger buckets, and other sample collection tools. All decontamination will be Level II decontamination as specified in SMPL-01, *Solids Sampling*. The core barrel portion of the core sampler will be wiped down between sample intervals and locations to remove visible soil or material. Decontamination of the core barrel will not be necessary because the core barrel will not come into contact with the sample when using a liner insert.

2.6 SAMPLE HANDLING AND SHIPPING

Samples will be processed in accordance with SMPL-01, *Solids Sampling*, to ensure that samples are documented properly and custody and sample integrity are maintained. All samples will be transported from the field to the on-site Sample Processing Laboratory.

TABLE 2-1
SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Sample Matrix	Lab	ASL	Preserve	Holding Time	Container	Sample Mass
Total Uranium Technetium-99 (TALs A and B)	Solid	On-site	B	None	12 months	250-mL widemouth glass	40g
Total VOCs (TAL C)	Solid	Off-site	B	Cool to 2°-6°C	14 days	60-mL widemouth glass with Teflon-lined lid	fill container to top (no head space)
Total SVOCs (TAL D)	Solid	Off-site	B	Cool to 2°-6°C	14 days	60-mL widemouth glass with Teflon-lined lid	90g
Total Pesticides (TAL E)	Solid	Off-site	B	Cool to 2°-6°C	14 days	60-mL widemouth glass with Teflon-lined lid	90g
TCLP VOCs (TAL F)	Solid	Off-site	B	Cool to 2°-6°C	14 days	60-mL amber glass with Teflon-lined lid	100g/300g QC (fill to top; no head space)
TCLP SVOCs/ Pesticides/ Herbicides (TAL G)	Solid	Off-site	B	Cool to 2°-6°C	14 days	60-mL glass with Teflon-lined lid	300g/900g QC
TCLP Metals (TAL H)	Solid	On-site	B	Cool to 2°-6°C	6 months	250-mL glass with Teflon-lined lid	100g/200g QC
Total VOC Matrix Spike and Matrix Spike Duplicate (TAL C)	Solid	Off-site	N/A	Cool to 2°-6°C	14 days	2 x 60-mL widemouth glass with Teflon-lined lid	fill container to top (no head space)
Alpha/Beta Screen	Solid	On-site	N/A	None	None	Any container	10g
Trip Blank	Liquid	Off-site	N/A	Cool to 2°-6°C; pH <2 by HCl or H_2SO_4	14 days	3 x 40mL glass with Teflon-lined lid	fill to top
Archive	Solid	N/A	N/A	None	12 months	250-mL widemouth glass	N/A

Notes: The alpha/beta screen is only required for samples destined for off-site laboratories (i.e., those undergoing TAL C through TAL G analysis).

Off-site samples will be recorded on a separate Chain-of-Custody form from the on-site samples.

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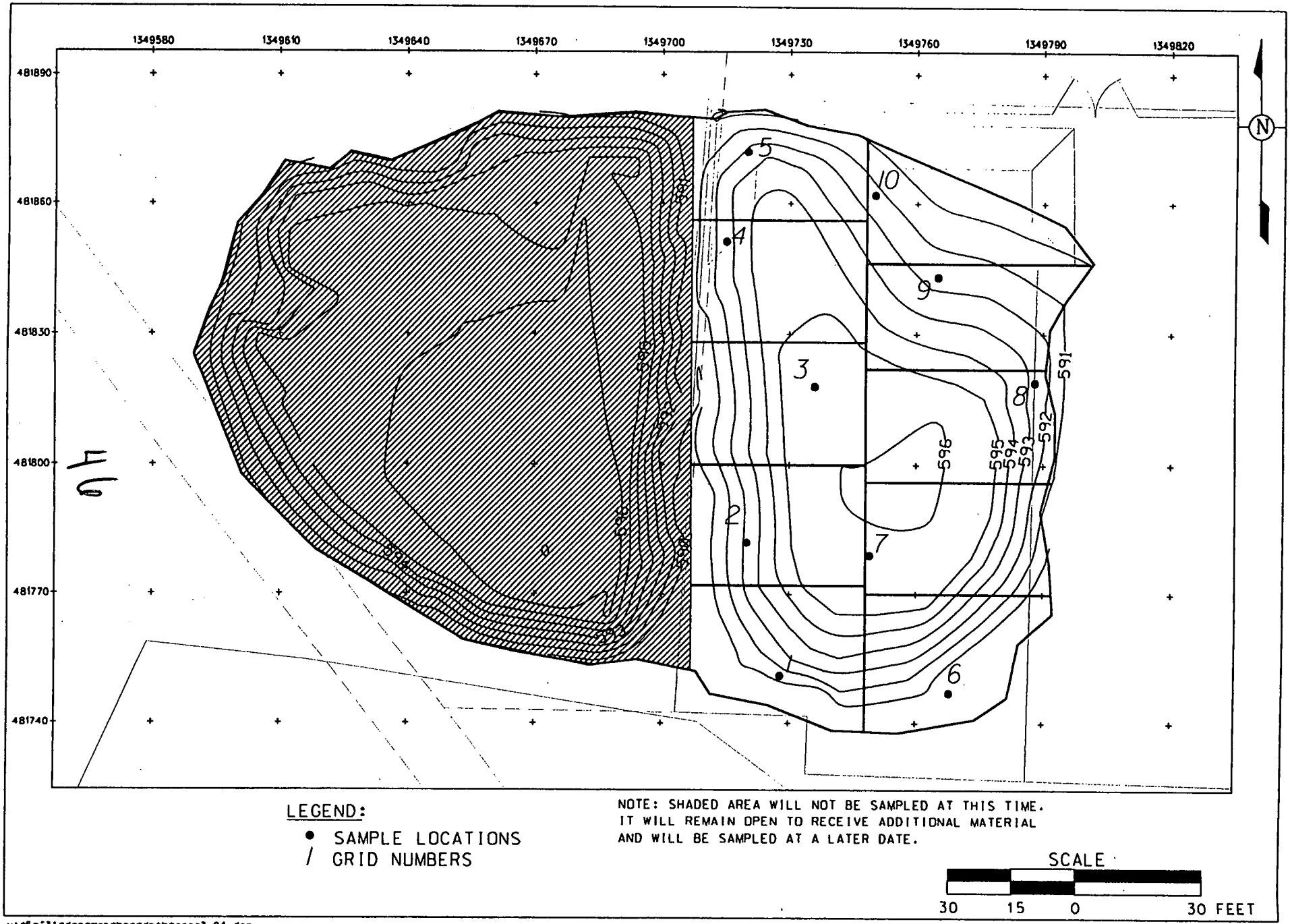

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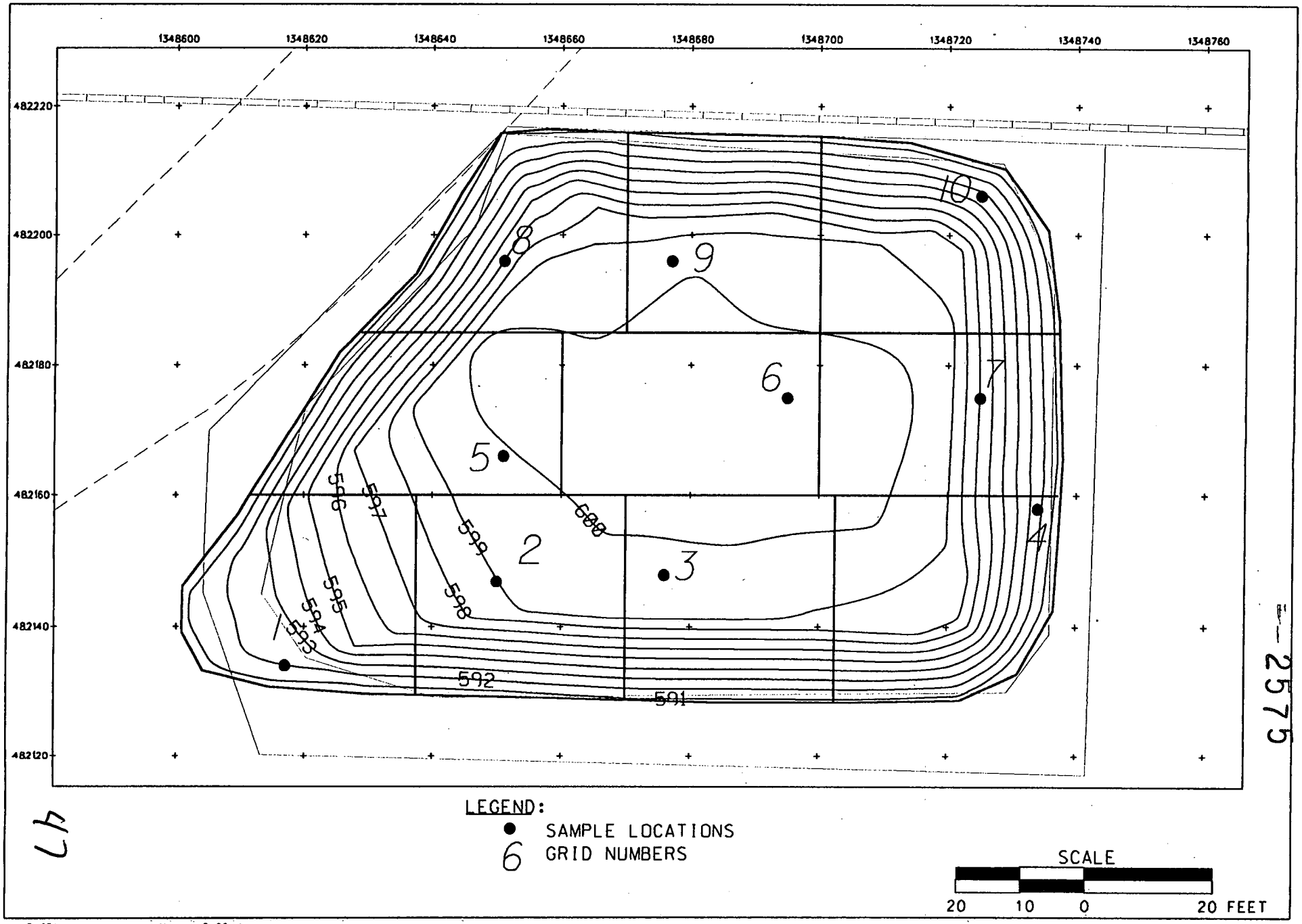
FIGURE 2-1 SB-1 SAMPLING LOCATIONS

27-APR-1999



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-2575

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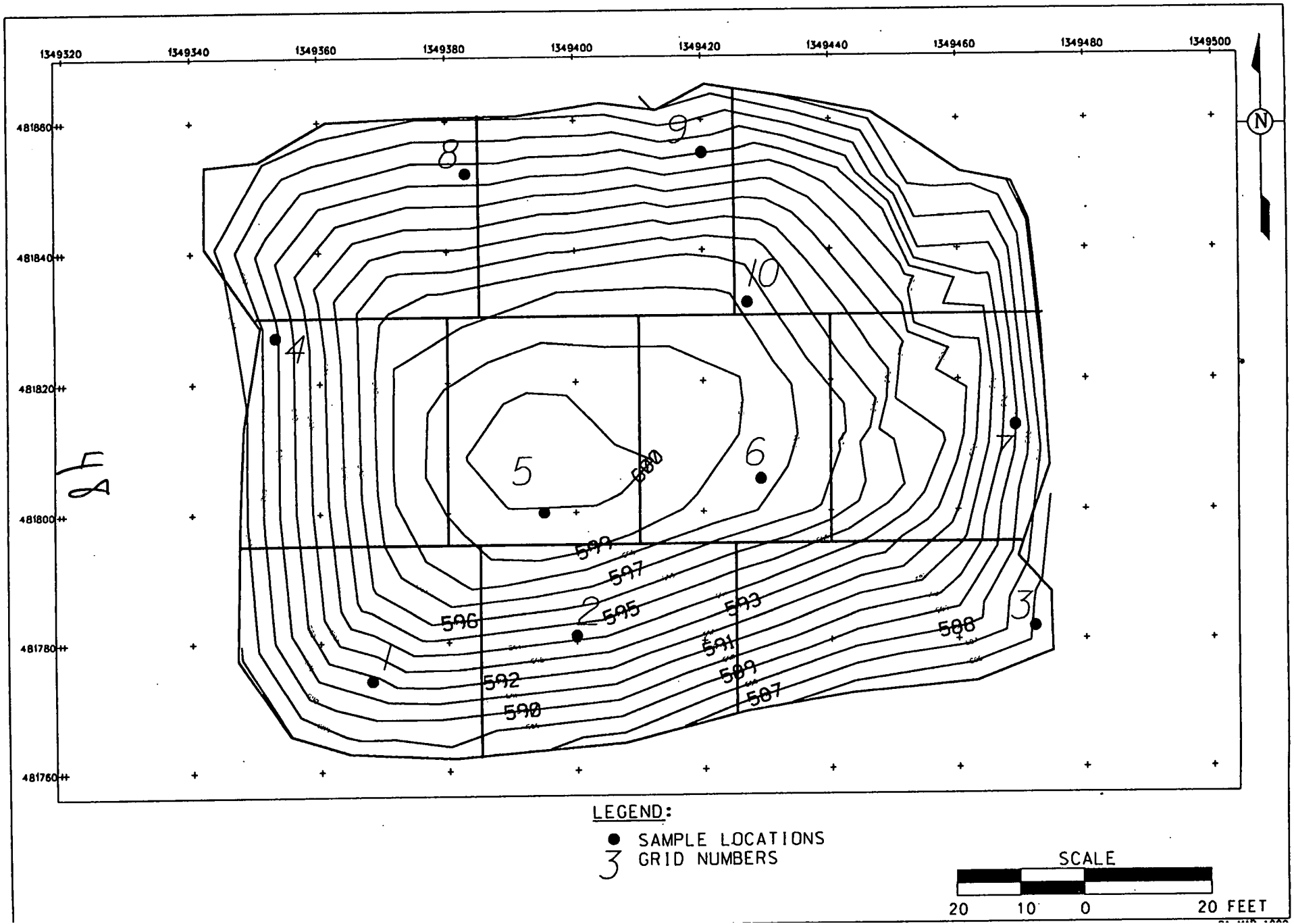
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-2. SP-2 SAMPLING LOCATIONS

01-MAR-1999


1349320
1349340
1349360
1349380
1349400
1349420
1349440
1349460
1349480
1349500
481860
481840
481820
481800
481780
481760
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LEGEND:
SAMPLE LOCATIONS
GRID NUMBERS
SCALE
20 10 0 20 FEET

3.0 REAL-TIME RADIOLOGICAL SCANNING

The real-time total uranium WAC investigation of surface soil in SP-1, SP-2, and SP-4 will be performed to cover as much of the stockpile surface as practical using the HPGe portable detectors or a mobile NaI detector, referred to as the Radiation Measurement System (RMS). The RMS can be the Radiation Tracking System (RTRAK), the Radiation Scanning System (RSS) or the GATOR. The final aerial coverage will be documented and reported upon completion of the real-time measurement program.

Real-time data gathered during this activity will be reported on an Excavation Monitoring Form (FS-F-5195). This form contains relevant information on the real-time data collection, characterization review of the data, and WAO acceptance of the characterization. The instructions for using this form area printed on the form. The Real-Time Field Lead, the Characterization Lead, and WAO representatives or designees will complete this form for each real-time measurement. The original forms will be placed in the WAO files.

3.1 RADIATION MEASUREMENT SYSTEM SCANNING COVERAGE

Real-time NaI detector system coverage using the RMS will be limited to safely accessible surfaces and will be as extensive as possible without jeopardizing worker safety. The real-time field team, supervisor, and project health and safety representative will jointly determine which areas are accessible based on field conditions at the time of measurements.

The NaI detector acquisition time will be set to 4 seconds and the data will be collected at a speed of one mile per hour. The onboard Global Positioning System (GPS) will be used to obtain positioning information with each detector measurement. The RMS scan data will be reviewed to determine if any single measurement exceeds 721 mg/kg total uranium, the trigger level established for NaI WAC measurements. If this trigger is exceeded, an HPGe measurement may be taken to confirm the RMS measurement, as discussed in Section 3.3.

A minimum of two Troxler® or Infrared Moisture Meter soil moisture readings will be collected in the area covered by the RMS. These moisture readings are necessary because measurements from HPGe and RMS detectors need to be adjusted to take into account the soil moisture. If a moisture reading

cannot be taken, a physical core sample will be collected for moisture testing. If collected, the moisture core samples will follow the same sample identification system as outlined in Section 3.4.

3.2 HPGe DETECTOR MEASUREMENTS

The HPGe portable detector systems will be used to obtain gamma measurements in those areas that cannot be safely accessed by the RMS but are accessible to the HPGe detector (e.g., steep side slopes). The objective of the HPGe measurements is to cover the areas of the pile that were not scanned by RMS, with the goal of covering as much of the surface of each pile as possible using real-time methods.

The HPGe detector system acquisition time will be set to 300 seconds (5 minutes). The detector height will be set at 1 meter above ground surface. All HPGe locations will be surveyed and marked. Each HPGe measurement will be identified as specified in Section 3.3. One Troxler® or Infrared Moisture Meter soil moisture reading will be collected in each grid block covered by the HPGe measurements. If a moisture reading cannot be taken, a physical core sample will be collected for moisture testing. If collected, the moisture core samples will follow the same sample identification system as outlined in Section 3.4.

One duplicate measurement will be taken for every 20 HPGe measurements collected for this project. The duplicate will immediately follow the original reading and will be conducted using the same detector with the same height and count time.

The HPGe data will be reviewed to determine if any single measurement exceeds 400 mg/kg total uranium, the trigger level established for HPGe WAC measurements at a 1-meter height. If this trigger is exceeded, an additional HPGe measurement at a lower detector height may be taken, as discussed in Section 3.3.

3.3 DETERMINING NEED FOR ADDITIONAL HPGe MEASUREMENTS

If RMS scans or 1-meter detector height HPGe measurements are greater than trigger level concentrations, confirmation and delineation may be required. This confirmation and delineation process is documented in Section 3.4 of the User Guidelines, Measurement Strategies, and Operational Factors for Deployment of In-Situ Gamma Spectrometry at the Fernald Site (User's Manual,

DOE 1998e). The circumscribed boundary of the RMS or 1-meter HPGe measurement above trigger limits will be located and marked (flags and/or stakes) on the surface of the stockpile by the Characterization and/or Survey Lead or designee. The location of the maximum activity will be identified in the field using a hand-held frisker or equivalent instrument. HPGe detectors will be used for all confirmation and delineation measurements. Confirmation measurements shall be made using detector heights of 15 cm and/or 31 cm (depending on required field of view) and a spectral acquisition time of five minutes at the suspect above-WAC location to reliably determine above-WAC boundaries. If either confirmation measurement exceeds the trigger level of 928 ppm, then the area exceeding the trigger level (i.e., above-WAC) shall be further delineated with the HPGe. The boundary of confirmed above-WAC material area shall be refined (delineated) using a detector height of 15 cm with a spectral acquisition time of five minutes on a 2-meter triangular grid covering the entire area indicated by the detection and confirmation measurements. The limits of the above-WAC area will be defined by HPGe measurements that are lower than the HPGe WAC trigger levels.

Confirming and delineating the extent of contamination with 31 cm and 15 cm HPGe measurements is at the discretion of the Characterization Lead or designee. Conditions may arise which warrant a different decision process for defining the extent of contamination (i.e., cost effectiveness, need for timely response, obvious discoloration in the soil, or other suspect above-WAC material may require physical sampling). The decision process for the unusual condition will be documented in applicable field activity logs and, if determined to be appropriate by the Characterization Lead or designee, with a Variance/Field Change Notice (V/FCN) as described in Section 4.4.

Duplicate measurements will be performed in the same manner described in Section 3.2, one per 20 measurements taken.

3.4 REAL-TIME MEASUREMENT IDENTIFICATION

The data from each run of the RMS will be uniquely identified. This identifier will consist of a prefix designating the area name (SP1, SP2, or SP4) followed by the run number, which is assigned by the real-time scanning personnel. For example, SP1-265 would be run 265 on SP-1.

Each HPGe measurement will have a unique identifier. This identifier will consist of a prefix designating the area name (SP1, SP2, or SP4), followed by the sample number within the area

(1 through x), followed by a letter designating the type of sample ("G" for gamma). A "D" will be used to designate the duplicate measurements. For example:

SP4-1-G-D is the first HPGe reading taken in SP-4 and is a duplicate measurement.

3.5 DATA MAPPING

As the measurements are acquired by the Survey and Real-Time Teams, the data will be electronically loaded into mapping software through manual file transfer or Ethernet. A set of maps and/or data summaries will be given to the Characterization Lead and WAO. Maps will be generated showing Northing (Y) and Easting (X) coordinate values (Ohio South Zone, #3402) as determined using standard survey practices and standard positioning instrumentation (electronic total stations and GPS receivers). The map will depict the following:

Surface Scan Coverage Map(s)

- RMS Location Map - showing field of view squares that are color coded for total uranium concentration and denotes batch numbers in title.
- HPGe Location Map - showing field of view circles that are color coded for total uranium concentration and that denotes identification number for each HPGe measurement. Also attach data printout that summarizes each HPGe measurement parameters and shows total uranium concentration.

  (Note both results can be shown on the same map.)

HPGe Confirmation/Delineation Map(s)

- HPGe Location Map - showing field of view circles that are color coded for total uranium concentration and that denotes identification number for each HPGe measurement. Also attach data printout that summarizes each HPGe measurement parameters and shows total uranium concentration.

The map and/or HPGe data summary printouts will be used to provide the Characterization Lead or designee with information to determine if additional scanning, confirmation, or delineation measurements are required.

3.6 SAMPLE COLLECTION BASED ON RMS AND HPGe MEASUREMENTS

If RMS identifies an area of surface soil above the trigger level discussed in Section 3.1 and the stockpile slope prohibits the use of HPGe to confirm and delineate the potential above-WAC area, a surface soil sample (0-6 inches) will be collected from a location within the measurement read area that exhibits the highest gross beta/gamma reading based on a portable survey meter/probe. This surface soil sample will be analyzed for total uranium (TAL B). If a surface sample is collected, it will be identified using the system developed for biased physical samples as outlined in Section 2.4.

SOIL PILE 1

F-2575

Moisture Corrected Total Uranium
RSS batch # 298
Single Spectra in ppm
Coverage Plot (Field of View 2.4 m radius)
Measurement Date: 5/4/99

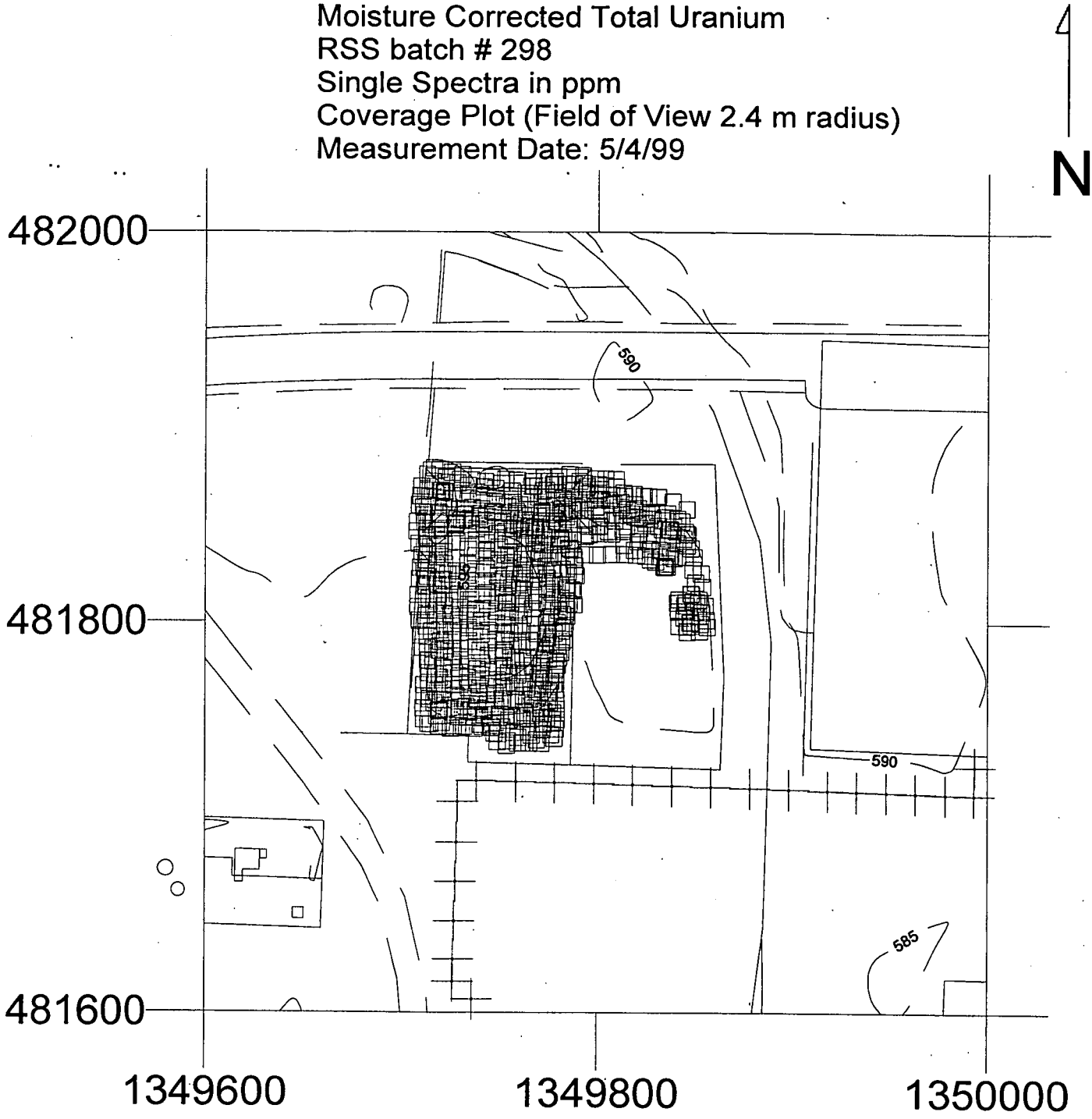
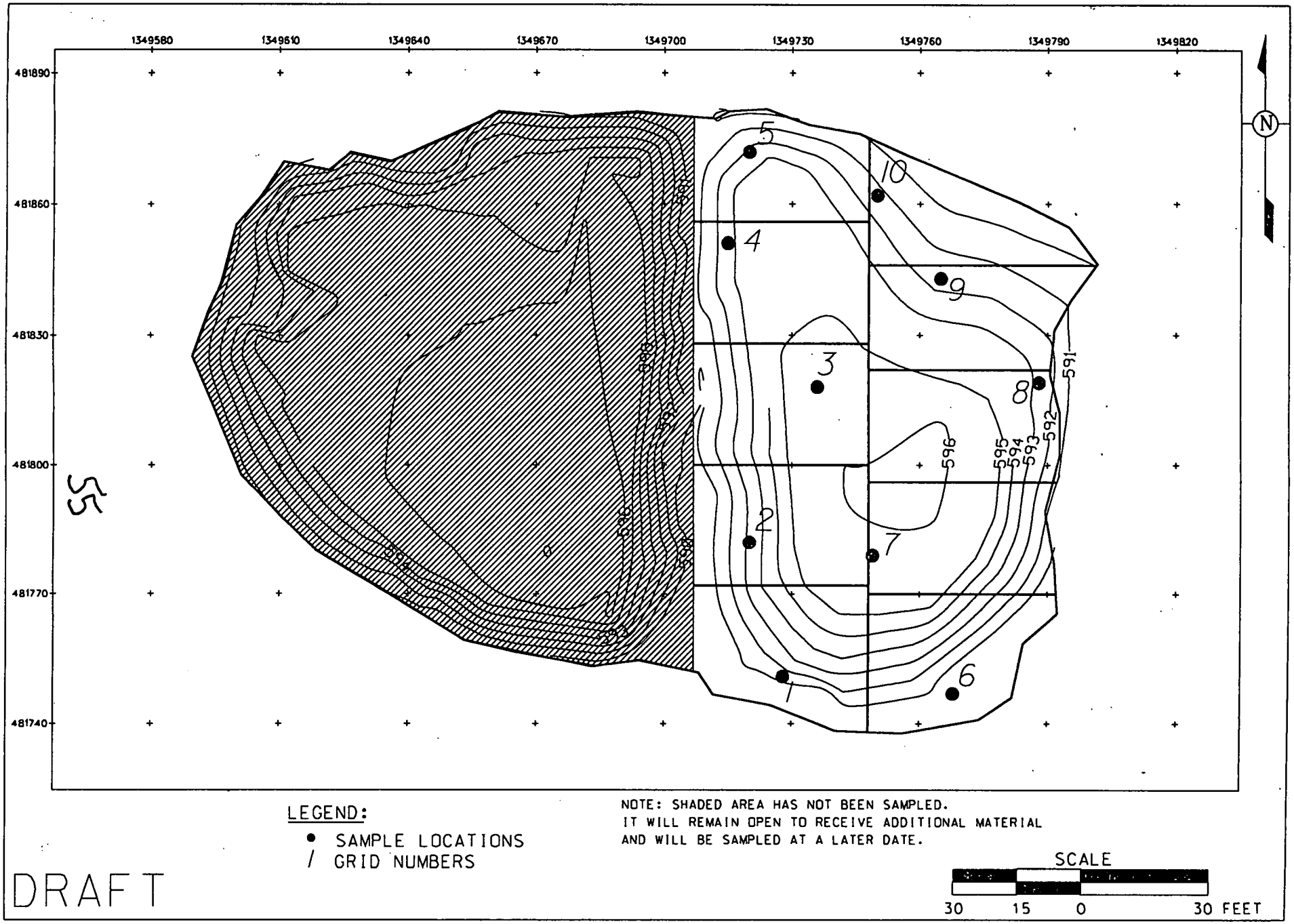


FIGURE 3-1 SP-1 REAL-TIME SCANNING COVERAGE



LEGEND:

- • SAMPLE LOCATIONS
- / GRID NUMBERS

NOTE: SHADED AREA HAS NOT BEEN SAMPLED.
IT WILL REMAIN OPEN TO RECEIVE ADDITIONAL MATERIAL
AND WILL BE SAMPLED AT A LATER DATE.

SCALE

30 15 0 30 FEET

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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 3-2. SP-1 SAMPLING LOCATIONS

01-OCT-1999

SOIL PILE 2

2575

Moisture Corrected Total Uranium
RSS batch # 299
Single Spectra in ppm
Coverage Plot (Field of View 2.4 m radius)
Measurement Date: 5/11/99

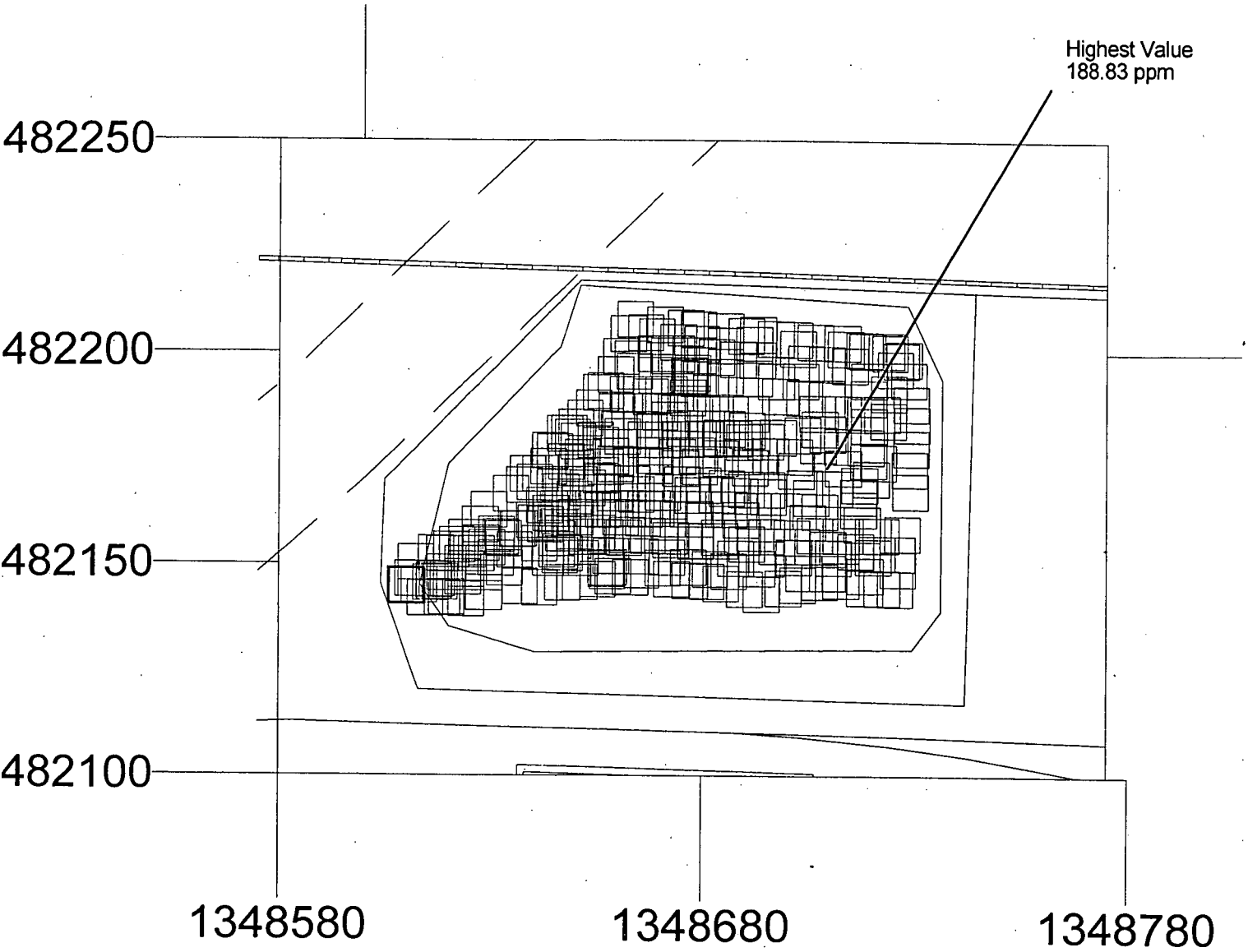
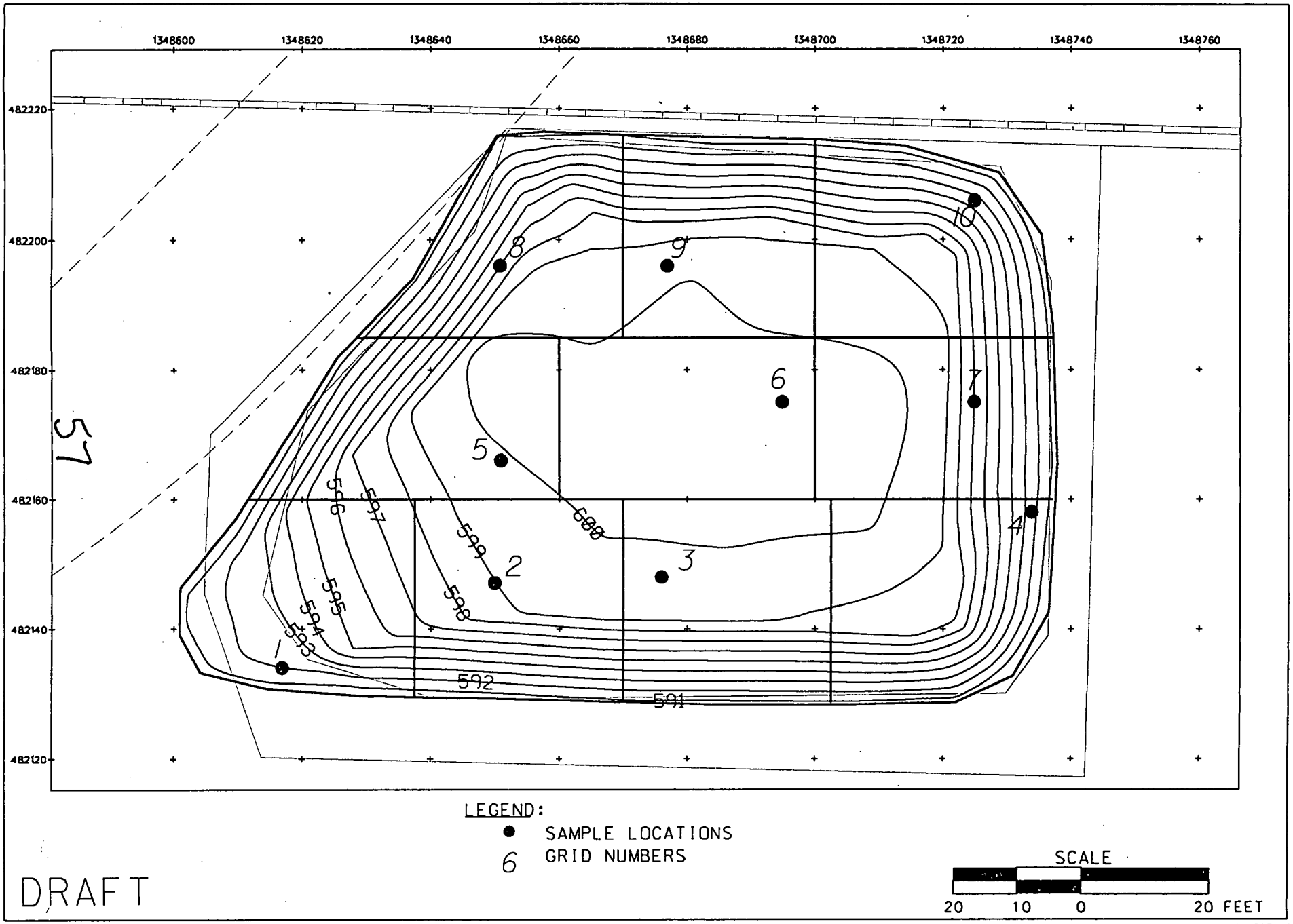


FIGURE 3-3 SP-2 REAL-TIME SCANNING COVERAGE



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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 3-4. SP-2 SAMPLING LOCATIONS

01-OCT-1999

SOIL PILE 4

2575

Moisture Corrected Total Uranium
RSS batches # 296 & 297
Single Spectra in ppm
Coverage Plot (Field of View 2.4 m radius)
Measurement Date: 5/4/99

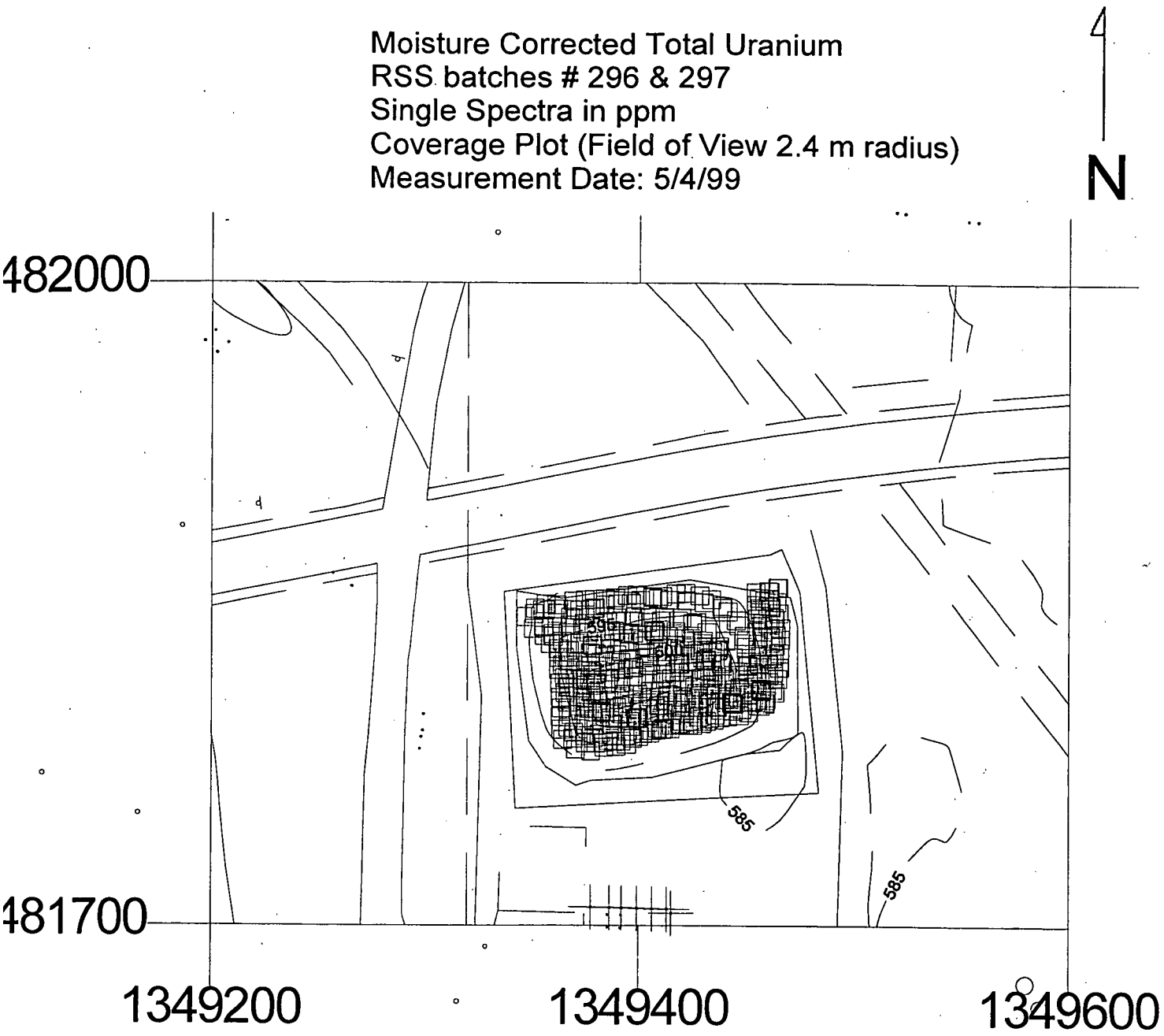
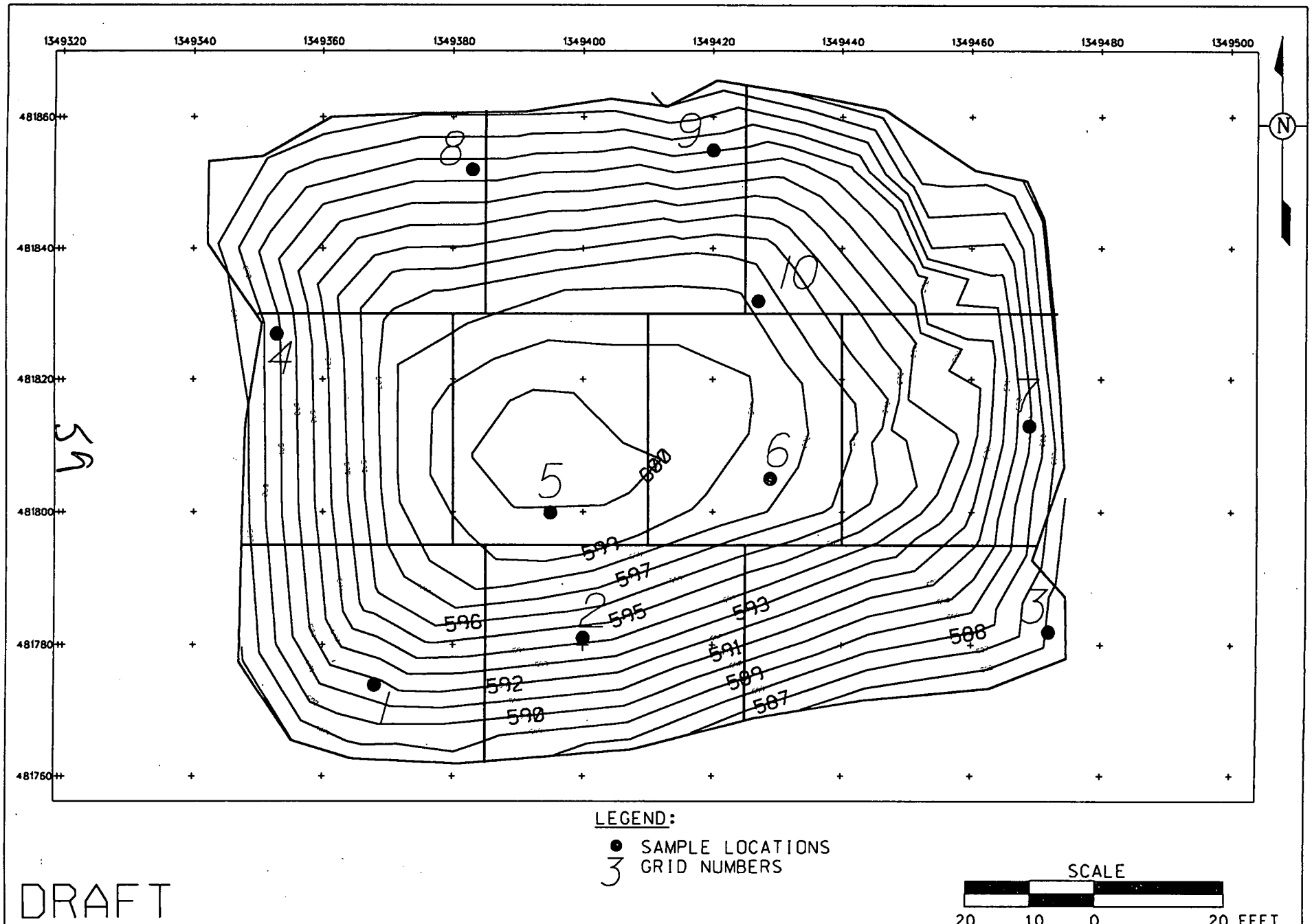


FIGURE 3-5 SP-4 REAL-TIME SCANNING COVERAGE



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STATE PLANAR COORDINATE SYSTEM 1983

01-OCT-1999

FIGURE 3-6. SP-4 SAMPLING LOCATIONS

4.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

4.1 FIELD QUALITY CONTROL SAMPLES, ANALYTICAL REQUIREMENTS, AND DATA VALIDATION

In accordance with the requirements of DQO SL-048, Rev. 5 and DQO SL-053, Rev. 0, the field quality control, analytical, and data validation requirements are as follows:

- All laboratory analyses will be performed at analytical support level (ASL) B.
- One trip blank will be taken each day that VOC samples are collected or 1 per 20 VOC samples that are collected, whichever is more frequent. In addition, a matrix spike and matrix spike duplicate sample will be collected for each VOC release or 1 per 20 VOC samples that are collected, whichever is more frequent.
- All field data will be validated. All analytical data will require a certificate of analysis and 10 percent of the analytical data will also require the associated quality assurance/quality control results. A minimum of 10 percent of the analytical data from each laboratory will be validated to ASL B.
- Real-time measurements will be performed at ASL A.
- One in 20 HPGe measurements will require a duplicate.

If any sample collection or analysis methods are used that are not in accordance with the SCQ, the Project Manager and Characterization Lead must determine if the qualitative data from the samples will be beneficial to predesign decision making. If the data will be beneficial, the Project Manager and Characterization Lead will ensure that:

- the PSP is revised to include references confirming that the new method is sufficient to support data needs,
- variations from the SCQ methodology are documented in the PSP, or
- data validation of the affected samples is requested or qualifier codes of J (estimated) and R (rejected) be attached to detected and nondetected results, respectively.

4.2 PROJECT-SPECIFIC PROCEDURES AND MANUALS

To assure consistency and data integrity, field activities in support of this PSP will follow the requirements and responsibilities outlined in controlled procedures and manufacturer operational manuals. Applicable procedures and manuals include:

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- SMPL-01, *Solids Sampling*
- SMPL-21, *Collection of Field Quality Control Samples*
- EQT-04, *Photoionization Detector*
- EQT-05, *Geodimeter® 4000 Survey System - Operation, Maintenance, and Calibration*
- EQT-06, *Geoprobe® Model 5400 Operation and Maintenance Manual*
- EQT-22, *Characterization of Gamma Sensitive Detectors*
- EQT-23, *Operation of ADCAM Series Analyzers with Gamma Sensitive Detectors*
- EQT-32, *Troxler® 3440 Series Surface Moisture/Density Gauge -- Calibration, Operation, and Maintenance*
- EQT-33, *Real-Time Differential Global Positioning System Operation*
- EQT-39, *ZeHex Infrared Moisture Meter*
- EQT-41, *Radiation Measurement Systems*
- EW-1023, *Management of Stockpiles*
- S.P. 766-S-1000, *Shipping Samples to Off-Site Laboratories*
- *Sitewide CERCLA Quality Assurance Project Plan (SCQ)*

4.3 PROJECT REQUIREMENTS FOR INDEPENDENT ASSESSMENTS

Project management has ultimate responsibility for the quality of the work processes and the results of the sampling activities covered by this PSP. The Quality Assurance (QA) organization will conduct independent assessments of the work process and operations to assure the quality of performance. Assessment will encompass technical and procedural requirements of this PSP and the SCQ. Independent assessments will be performed by conducting a surveillance. Surveillances will be planned and documented according to Section 12.3 of the SCQ.

4.4 IMPLEMENTATION OF FIELD CHANGES

If field conditions require changes or variances, the Field Sampling Lead must obtain written or verbal approval (electronic mail is acceptable) from the Characterization Lead, QA, and WAO before the changes may be implemented. If the change involves real-time scanning, the Real-Time Lead must also

give written or verbal approval before the change can be implemented. Changes to the PSP will be noted in the applicable Field Activity Logs and on a V/FCN. QA must receive the completed V/FCN, which includes the signatures of the Characterization Lead, Sampling Lead, Project Manager, WAO, QA, and Real-Time Lead within seven working days of implementation of the change.

5.0 HEALTH AND SAFETY

The Health and Safety Lead, Field Sampling Leads, and team members will assess the safety of performing sampling activities on the surfaces of SP-1, SP-2, and SP-4. This will include vehicle positioning limitations, fall hazards, and vehicle stability if Geoprobe® or real-time scanning work is performed on the side slopes of the piles.

Technicians will conform to precautionary surveys performed by personnel representing the Radiological Control, Safety, and Industrial Hygiene organizations. All work on this project will be performed in accordance with applicable Environmental Monitoring procedures, RM-0020 (Radiological Control Requirements Manual), RM-0021 (Safety Performance Requirements Manual), Fluor Daniel Fernald work permit, Radiological Work Permit (RWP), penetration permits, and other applicable permits. Concurrence with applicable safety permits (indicated by the signature of each field team member assigned to this project) is required by each team member in the performance of their assigned duties.

The Field Sampling Lead will ensure that each technician performing sampling related to this project has been trained to the relevant sampling procedures including safety precautions. Technicians who do not sign project safety and technical briefing forms will not participate in the execution of sampling activities related to the completion of assigned project responsibilities. A copy of applicable safety permits/surveys issued for worker safety and health will be posted at each stockpile during sampling activities.

A safety briefing will be conducted prior to the initiation of field activities. All emergencies shall be reported immediately to the site communication center at 648-6511 or by contacting "control" on the radio.

6.0 DATA MANAGEMENT

A data management process will be implemented so information collected during the investigation will be properly managed to satisfy data end use requirements after completion of the field activities. As specified in Section 5.1 of the SCQ, sampling teams will describe daily activities on a Field Activity Log, which should be sufficiently detailed to allow accurate reconstruction of the events at a later date without reliance on memory. Sample Collection Logs will be completed according to protocol specified in Appendix B of the SCQ and in applicable procedures. These forms will be maintained in loose-leaf form and uniquely numbered following the field sampling event. At least weekly, a copy of all field logs will be sent to the Characterization Lead.

Real-time data will be reported on an Excavation Monitoring Form. All field measurements, observations, and sample collection information associated with physical sample collection will be recorded, as applicable, on the Sample Collection Log, the Field Activity Log, and the Chain of Custody/Request for Analysis Form as required. The method of sample collection will be specified in the Field Activity Log. Borehole Abandonment Logs will not be required. The PSP number (20200-PSP-0003) will be on all documentation associated with these sampling activities.

Samples will be assigned a unique sample identifier, as explained in Sections 2.4 and 3.3 and listed in Appendix C. This unique sample identifier will appear on the Sample Collection Log and Chain of Custody/Request for Analysis and will be used to identify the samples during analysis, data entry, and data management.

Technicians will review all field data for completeness and accuracy and then forward the data package to the Data Validation Contact for final review. The field data package will be filed in the records of the Environmental Management Project.

The Data Management organization will perform data entry into the Sitewide Environmental Database (SED). Field logs will be maintained in loose-leaf form during the field recording activities. Analytical data from the off-site laboratory will be reviewed by the Project Lead prior to entry or transfer of the data to the SED from the Fernald Analytical Customer Tracking System (FACTS) database. The analytical data validation requirements are outlined in Section 4.1.

REFERENCES

U.S. Department of Energy, 1998a, "Sitewide Excavation Plan," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1998b, "Waste Acceptance Criteria Attainment Plan for the On-Site Disposal Facility," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1998c, "Waste Acceptance Criteria (WAC) Attainment Report for the Area 1, Phase I West Impacted Soil Stockpile," Draft, Revision A, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1998d "Project Specific Plan for Sampling of Soil Pile 5 (SP-5) for OSDF WAC Attainment," Revision 0, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1998e, "User Guidelines, Measurement Strategies, and Operational Factors for Deployment of In-Situ Gamma Spectrometry at the Fernald Site," Draft, Revision B, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1998f, "Project Specific Plan for WAC Attainment Sampling of Area 7 Soils," Revision 0, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

65

APPENDIX A

DATA QUALITY OBJECTIVES SL-048, REV. 5
AND
DATA QUALITY OBJECTIVES SL-053, REV. 0

Control Number F-2575

Fernald Environmental Management Project

Data Quality Objectives

Title: Delineating the Extent of Constituents of Concern During Remediation Sampling

Number: SL-048

Revision: 5

Effective Date: February 26, 1999

Contact Name: Eric Kroger

Approval: (signature on file) Date: 2/25/99
James E. Chambers
DQO Coordinator

Approval: (signature on file) Date: 2/26/99
J.D. Chiou
SCEP Project Director

Rev. #	0	1	2	3	4	5	6
Effective Date:	9/19/97	10/3/97	4/15/98	6/17/98	7/14/98	2/26/99	

DATA QUALITY OBJECTIVES
Delineating the Extent of Constituents of Concern During Remediation Sampling

Members of Data Quality Objectives (DQO) Scoping Team

The members of the DQO team include a project lead, a project engineer, a field lead, a statistician, a lead chemist, a sampling supervisor, and a data management lead.

Conceptual Model of the Site

Media is considered contaminated if the concentration of a constituent of concern (COC) exceeds the final remediation levels (FRLs). The extent of specific media contamination was estimated and published in the Operable Unit 5 Feasibility Study (FS). These estimates were based on kriging analysis of available data for media collected during the Remedial Investigation (RI) effort and other FEMP environmental characterization studies. Maps outlining contaminated media boundaries were generated for the Operable Unit 5 FS by overlaying the results of the kriging analysis data with isoconcentration maps of the other constituents of concern (COCs), as presented in the Operable Unit 5 RI report, and further modified by spatial analysis of maps reflecting the most current media characterization data. A sequential remediation plan has been presented that subdivides the FEMP into seven construction areas. During the course of remediation, areas of specific media may require additional characterization so remediation can be carried out as thoroughly and efficiently as possible. As a result, additional sampling may be necessary to accurately delineate a volume of specific media as exceeding a target level, such as the FRL or the Waste Attainment Criterion (WAC). Each individual Project-Specific Plan (PSP) will identify and describe the particular media to be sampled. This DQO covers all physical sampling activities associated with Pre-design Investigations, precertification sampling, WAC attainment sampling or regulatory monitoring that is required during site remediation.

1.0 Statement of Problem

If the extent (depth and/or area) of the media COC contamination is unknown, then it must be defined with respect to the appropriate target level (FRL, WAC, or other specified media concentration).

2.0 Identify the Decision

Delineate the horizontal and/or vertical extent of media COC contamination in an area with respect to the appropriate target level.

3.0 Inputs That Affect the Decision

Informational Inputs - Historical data, process history knowledge, the modeled extent of COC contamination, and the origins of contamination will be required to

establish a sampling plan to delineate the extent of COC contamination. The desired precision of the delineation must be weighed against the cost of collecting and analyzing additional samples in order to determine the optimal sampling density. The project-specific plan will identify the optimal sampling density.

Action Levels - COCs must be delineated with respect to a specific action level, such as FRLs and On-Site Disposal Facility (OSDF) WAC concentrations. Specific media FRLs are established in the OU2 and OU5 RODs, and the WAC concentrations are published in the OU5 ROD. Media COCs may also require delineation with respect to other action levels that act as remediation drivers, such as Benchmark Toxicity Values (BTVs).

4.0 The Boundaries of the Situation

Temporal Boundaries - Sampling must be completed within a time frame sufficient to meet the remediation schedule. Time frames must allow for the scheduling of sampling and analytical activities, the collection of samples, analysis of samples and the processing of analytical data when received.

Scale of Decision Making - The decision made based upon the data collected in this investigation will be the extent of COC contamination at or above the appropriate action level. This delineation will result in media contaminant concentration information being incorporated into engineering design, and the attainment of established remediation goals.

Parameters of Interest - The parameters of interest are the COCs that have been determined to require additional delineation before remediation design can be finalized with the optimal degree of accuracy.

5.0 Decision Rule

If existing data provide an unacceptable level of uncertainty in the COC delineation model, then additional sampling will take place to decrease the model uncertainty. When deciding what additional data is needed, the costs of additional sampling and analysis must be weighed against the benefit of reduced uncertainty in the delineation model, which will eventually be used for assigning excavation, or for other purposes.

6.0 Limits on Decision Errors

In order to be useful, data must be collected with sufficient areal and depth coverage, and at sufficient density to ensure an accurate delineation of COC concentrations. Analytical sensitivity and reproducibility must be sufficient to differentiate the COC concentrations below their respective target levels.

Types of Decision Errors and Consequences

Decision Error 1 - This decision error occurs when the decision maker determines that the extent of media contaminated with COCs above action levels is not as extensive as it actually is. This error can result in a remediation design that fails to incorporate media contaminated with COC(s) above the action level(s). This could result in the re-mobilization of excavation equipment and delays in the remediation schedule. Also, this could result in media contaminated above action levels remaining after remediation is considered complete, posing a potential threat to human health and the environment.

Decision Error 2 - This decision error occurs when the decision maker determines that the extent of media contaminated above COC action levels is more extensive than it actually is. This error could result in more excavation than necessary, and this excess volume of materials being transferred to the OSDF, or an off-site disposal facility if contamination levels exceed the OSDF WAC.

True State of Nature for the Decision Errors - The true state of nature for Decision Error 1 is that the maximum extent of contamination above the FRL is more extensive than was determined. The true state of nature for Decision Error 2 is that the maximum extent of contamination above the FRL is not as extensive as was determined. Decision Error 1 is the more severe error.

7.0 Optimizing Design for Useable Data

7.1 Sample Collection

A sampling and analytical testing program will delineate the extent of COC contamination in a given area with respect to the action level of interest. Existing data, process knowledge, modeled concentration data, and the origins of contamination will be considered when determining the lateral and vertical extent of sample collection. The cost of collecting and analyzing additional samples will be weighed against the benefit of reduced uncertainty in the delineation model. This will determine the sampling density. Individual PSPs will identify the locations and depths to be sampled, the sampling density necessary to obtain the desired accuracy of the delineation, and if samples will be analyzed by the on-site or off-site laboratory. The PSP will also identify the sampling increments to be selectively analyzed for concentrations of the COC(s) of interest, along with field work requirements. Analytical requirements will be listed in the PSP. The chosen analytical methodologies are able to achieve a detection limit capable of resolving the COC action level. Sampling of groundwater monitoring wells may require different purge requirements than those stated in the SCQ (i.e., dry well definitions or small purge volumes). In order to accommodate sampling of wells that go dry prior to completing the purge of the necessary well volume, attempts to sample the

monitoring wells will be made 24 hours after purging the well dry. If, after the 24 hour period, the well does not yield the required volume, the analytes will be collected in the order stated in the applicable PSP until the well goes dry. Any remaining analytes will not be collected. In some instances, after the 24 hour wait the well may not yield any water. For these cases, the well will be considered dry and will not be sampled.

7.2 COC Delineation

The media COC delineation will use all data collected under the PSP, and if deemed appropriate by the Project Lead, may also include existing data obtained from physical samples, and if applicable, information obtained through real-time screening. The delineation may be accomplished through modeling (e.g. kriging) of the COC concentration data with a confidence limit specific to project needs that will reduce the potential for Decision Error 1. A very conservative approach to delineation may also be utilized where the boundaries of the contaminated media are extended to the first known vertical and horizontal sample locations that reveal concentrations below the desired action level.

7.3 QC Considerations

Laboratory work will follow the requirements specified in the SCQ. If analysis is to be carried out by an off-site laboratory, it will be a Fluor Daniel Fernald approved full service laboratory. Laboratory quality control measures include a media prep blank, a laboratory control sample (LCS), matrix duplicates and matrix spike. Typical Field QC samples are not required for ASL B analysis. However the PSPs may specify appropriate field QC samples for the media type with respect to the ASL in accordance with the SCQ, such as field blanks, trip blanks, and container blanks. All field QC samples will be analyzed at the associated field sample ASL. Data will be validated per project requirements, which must meet the requirements specified in the SCQ. Project-specific validation requirements will be listed in the PSP.

Per the Sitewide Excavation Plan, the following ASL and data validation requirements apply to all **soil and soil field QC samples** collected in association with this DQO:

- If samples are analyzed for Pre-design Investigations and/or Precertification, 100% of the data will be analyzed per ASL B requirements. For each laboratory used for a project, 90% of the data will require only a Certificate of Analysis, the other 10% will require the Certificate of Analysis and all associated QA/QC results, and will be validated to ASL B. Per Appendix H of the SEP, the minimum detection level (MDL) for these analyses will be established at approximately 10% of the action level (the action level for precertification is the

FRL; the action level for pre-design investigations can be several different action levels, including the FRL, the WAC, RCRA levels, ALARA levels, etc.). If this MDL is different from the SCQ-specified MDL, the ASL will default to ASL E, though other analytical requirements will remain as specified for ASL B.

- If samples are analyzed for WAC Attainment and/or RCRA Characteristic Areas Delineation, 100% of the data will be analyzed and reported to ASL B with 10% validated. The ASL B package will include a Certificate of Analysis along with all associated QA/QC results. Total uranium analyses using a higher detection limit than is required for ASL B (10 mg/kg) may be appropriate for WAC attainment purposes since the WAC limit for total uranium is 1,030 mg/kg. In this case, an ASL E designation will apply to the analysis and reporting to be performed under the following conditions:
    - all of the ASL B laboratory QA/QC methods and reporting criteria will apply with the exception of the total uranium detection limit
    - the detection limit will be ≤10% of the WAC limit (e.g., ≤103 mg/kg for total uranium).
- If delineation data are also to be used for certification, the data must meet the data quality objectives specified in the Certification DQO (SL-043).
- Validation will include field validation of field packages for ASL B or ASL D data.

All data will undergo an evaluation by the Project Team, including a comparison for consistency with historical data. Deviations from QC considerations resulting from evaluating inputs to the decision from Section 3, must be justified in the PSP such that the objectives of the decision rule in Section 5 are met.

7.4 Independent Assessment

Independent assessment shall be performed by the FEMP QA organization by conducting surveillances. Surveillances will be planned and documented in accordance with Section 12.3 of the SCQ.

7.5 Data Management

Upon receipt from the laboratory, all results will be entered into the SED as qualified data using standard data entry protocol. The required ASL B, D or E data will undergo analytical validation by the FEMP validation team, as required (see Section 7.3). The Project Manager will be responsible to determine data usability as it pertains to supporting the DQO decision of determining delineation of media

COC's.

7.6 Applicable Procedures

Sample collection will be described in the PSP with a listing of applicable procedures. Typical related plans and procedures are the following:

- Sitewide Excavation Plan (SEP)
- Sitewide CERCLA Quality Assurance Project Plan (SCQ).
- SMPL-01, *Solids Sampling*
- SMPL-02, *Liquids and Sludge Sampling*
- SMPL-21, *Collection of Field Quality Control Samples*
- EQT-06, *Geoprobe® Model 5400 Operation and Maintenance*
- EQT-23, *Operation of High Purity Germanium Detectors*
- EQT-30, *Operation of Radiation Tracking Vehicle Sodium Iodide Detection System*

Data Quality Objectives
Delineating the Extent of Constituents of Concern During Remediation Sampling

1A. Task/Description: Delineating the extent of contamination above the FRLs

1.B. Project Phase: (Put an X in the appropriate selection.)

RI ☐ FS ☐ RD ☒ RA ☐ R_vA ☐ OTHER ☐

1.C. DQO No.: SL-048, Rev. 5 DQO Reference No.: _____

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2. Media Characterization: (Put an X in the appropriate selection.)

Air ☐ Biological ☐ Groundwater ☒ Sediment ☒ Soil ☒

Waste ☒ Wastewater ☐ Surface water ☐ Other (specify) _____.

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3. Data Use with Analytical Support Level (A-E): (Put an X in the appropriate Analytical Support Level selection(s) beside each applicable Data Use.)

Site Characterization A☐ B☒ C☐ D☒ E☒	Risk Assessment A☐ B☐ C☐ D☐ E☐
Evaluation of Alternatives A☐ B☐ C☐ D☐ E☐	Engineering Design A☐ B☒ C☐ D☒ E☒
Monitoring during remediation A☒ B☒ C☐ D☒ E☒	Other A☐ B☐ C☐ D☐ E☐

4.A. Drivers: Remedial Action Work Plans, Applicable or Relevant and Appropriate Requirements (ARARs) and the OU2 and/or OU5 Record of Decision (ROD).

4.B. Objective: Delineate the extent of media contaminated with a COC (or COCs) with respect to the action level(s) of interest.

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5. Site Information (Description):

6.A. Data Types with appropriate Analytical Support Level Equipment Selection and SCQ Reference: (Place an "X" to the right of the appropriate box or boxes selecting the type of analysis or analyses required. Then select the type of equipment to perform the analysis if appropriate. Please include a reference to the SCQ Section.)

1.	pH	[X] *	2.	Uranium	[X] *	3.	BTX	[ ]
	Temperature	[X] *		Full Radiological	[X] *		TPH	[ ]
	Specific Conductance	[X] *		Metals	[X] *		Oil/Grease	[ ]
	Dissolved Oxygen	[X] *		Cyanide	[ ]			
	Technetium-99	[X] *		Silica	[ ]			

4.	Cations	[ ]	5.	VOA	[X] *	6. Other (specify)
	Anions	[ ]		BNA	[X] *	
	TOC	[ ]		Pesticides	[X] *	
	TCLP	[X] *		PCB	[X] *	
	CEC	[ ]		COD	[ ]	

*If constituent is identified for delineation in the individual PSP.

6.B. Equipment Selection and SCQ Reference:

	Equipment Selection	Refer to SCQ Section
ASL A	_____	SCQ Section: _____
ASL B	X	SCQ Section: App. G Tables G-1&G-3
ASL C	_____	SCQ Section: _____
ASL D	X	SCQ Section: App. G Tables G-1&G-3
ASL E	X (See sect. 7.3, pg. 6)	SCQ Section: App. G Tables G-1&G-3

7.A. Sampling Methods: (Put an X in the appropriate selection.)

Biased [X] Composite [ ] Environmental [X] Grab [X] Grid [X]

Intrusive [X] Non-Intrusive [ ] Phased [ ] Source [ ]

DQO Number: SL-048, Rev. 5

7.B. Sample Work Plan Reference: This DQO is being written prior to the PSPs.

Background samples: OU5 RI

7.C. Sample Collection Reference:

Sample Collection Reference: SMPL-01, SMPL-02, EQT-06

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8. Quality Control Samples: (Place an "X" in the appropriate selection box.)

8.A. Field Quality Control Samples:

Trip Blanks	[X] *	Container Blanks	[X] ++
Field Blanks	[X] +	Duplicate Samples	[X] ***
Equipment Rinsate Samples	[X] ***	Split Samples	[X] **
Preservative Blanks	[ ]	Performance Evaluation Samples	[ ]

Other (specify)

* For volatile organics only
** Split samples will be collected where required by EPA or OEPA.
*** If specified in PSP.
\+ Collected at the discretion of the Project Manager (if warranted by field conditions)
++ One per Area and Phase Area per container type (i.e. stainless steel core liner/plastic core liner/Geoprobe tube).

8.B. Laboratory Quality Control Samples:

Method Blank	[X]	Matrix Duplicate/Replicate	[X]
Matrix Spike	[X]	Surrogate Spikes	[ ]
Tracer Spike	[ ]		

Other (specify) Per SCQ

9. Other: Please provide any other germane information that may impact the data quality or gathering of this particular objective, task or data use.

Control Number 2575

Fernald Environmental Management Project

Data Quality Objectives

Title: Real-Time Excavation Monitoring For Total Uranium Waste Acceptance Criteria (WAC)

Number: SL-053

Revision: 0

Final Draft: 4/22/99

Contact Name: John Centers

Approval: _____ Date: 4/22/99
James E. Chambers
DQO Coordinator

Approval: _____ Date: 4/22/99
J. D. Chiou
SCEP Project Director

Rev. #	0						
Effective Date:	4/22/99						

DATA QUALITY OBJECTIVES
Excavation Monitoring for Total Uranium Waste Acceptance Criteria (WAC)

Members of Data Quality Objectives (DQO) Scoping Team

The members of the scoping team included individuals with expertise in QA, analytical methods, field construction, statistics, laboratory analytical techniques, waste management, waste acceptance, data management, and excavation monitoring.

Conceptual Model of the Site

Fernald Environmental Management Project (FEMP) remediation includes the construction of an on-site disposal facility (OSDF) to be used for the safe permanent disposal of materials at or above the site final remediation levels (FRLs), but below the waste acceptance criteria (WAC) for constituents of concern (WAC COCs). The WAC concentrations for several constituents, including total uranium, were developed using fate and transport modeling, and were established to prevent a breakthrough of unacceptable levels of contamination (greater than a specified Maximum Contaminant Level to the underlying Great Miami Aquifer) over a 1000-year period of OSDF performance. The WAC for total uranium and other area-specific WAC COCs as referenced in the Operable Unit 5 (OU5) and Operable Unit 2 (OU2) Records Of Decision (RODs), the Waste Acceptance Plan for the On-Site Disposal Facility (WAC Plan), and the OSDF Impacted Materials Placement Plan (IMPP), must be achieved for all soil and soil-like materials that have been identified for disposal in the OSDF.

The extent of soil contamination requiring remediation was estimated and published in both the Operable Unit 5 and Operable Unit 2 Feasibility Studies (FS). These estimates were based on modeling analysis of available uranium data from soil samples collected during the Remedial Investigation (RI) efforts and from other environmental studies conducted at the FEMP. Maps outlining boundaries of soil contamination were generated for both the Operable Unit 5 and Operable Unit 2 FS documents by overlaying the results of the modeling analysis of uranium data with isoconcentration maps of other COCs. The soil contamination maps were further modified by conducting spatial analysis on the most current soil characterization data.

A sequential remediation plan has been presented which subdivides the FEMP into ten (10) independent remediation areas. Extensive historical sampling has demonstrated that in each of these 10 areas potentially above-WAC concentrations may not be present, may be limited to one WAC COC, or consist of a subset of WAC COCs. According to the Sitewide Excavation Plan (SEP) only WAC COCs

with a demonstrated or likely presence in an area will be evaluated during remedial design and implementation. This DQO will be used to define the WAC decision-making process using excavation monitoring instrumentation in areas where soil and soil-like material is being excavated and total uranium is a WAC COC.

1.0 Statement of Problem

Adequate information must be available to demonstrate excavated soils are acceptable or unacceptable for disposal in the OSDF, based on the total uranium WAC.

Available Resources

Time: WAC decision-making information of sufficient quality must be made available to the Project Manager (or designee), characterization representative, and Waste Acceptance Operations representative (decision makers) prior to excavation and disposition of soil and soil-like materials.

Project Constraints: WAC decision-making information must be collected and assimilated with existing manpower and instrumentation to support the remediation schedule. Successful remediation of applicable areas, including excavation and placement of soil and soil-like material in the OSDF, is dependent on the performance of this work.

Summary of the Problem

Excavated soil must be classified as either of the following:

1. Having concentrations of total uranium at or above the WAC, and therefore, unacceptable for disposal in the OSDF, or

2. Having concentrations of total uranium below the WAC, and therefore, acceptable for disposal in the OSDF.

2.0 Identify the Decision

Decision

The WAC decision-making process will result in the classification of defined soil volumes as either meeting or exceeding the 1,030 ppm total uranium WAC.

Possible Results

1. A defined volume of soil has concentrations of total uranium at or above the WAC. This material is classified as unacceptable for placement in the OSDF, and will be identified, excavated, and segregated pending off-site disposition.

2. A defined volume of soil has concentrations of total uranium below the total uranium WAC. This soil is classified as acceptable for placement in the OSDF and is transported directly from the excavation to the OSDF for placement.

3.0 Identify Inputs That Affect the Decision

Required Information

The total uranium WAC published in the Waste Acceptance Criteria Attainment Plan for the OSDF, historical data, pre-design investigation data, and in-situ monitoring information collected prior to and during excavation are required to determine whether a specified volume of soil meets or exceeds the total uranium WAC.

Source of Informational Input

The list of sitewide OSDF WAC COCs identified in the OU2 and OU5 RODs and the WAC Plan will be referenced. Historical area specific data from the Sitewide Environmental Database (SED) will also be retrieved and evaluated for both radiological and chemical WAC constituents. This information will be utilized to determine area specific WAC COCs.

Non-invasive real-time excavation monitoring in areas where total uranium is a WAC concern will involve measurements collected with mobile and/or stationary in-situ equipment. These pieces of equipment are collectively called the Radiation Measuring Systems (RMS) and consists of three different vehicles equipped with sodium iodide detectors: a modified diesel powered farm tractor known as the Radiation Tracking System (RTRAK), a modified diesel powered six wheel utility vehicle (Gator), and a modified jogging stroller known as the Radiation Scanning System (RSS). These measurements will be collected from the surface of each excavation lift prior to excavation. Information compiled from this real-time monitoring will be assimilated and reviewed by decision makers to classify lifts or sections of lifts as either acceptable or unacceptable for placement in the OSDF.

Methods of Analysis

The most practical measurement methods with the required resolution will be employed to determine total uranium levels in the evaluated material in relation to the not-to-exceed (NTE) total uranium WAC in applicable areas.

4.0 The Boundaries of the Situation

Spatial Boundaries

Domain of the Decision: The boundaries where excavation monitoring for total uranium will be used is limited to soils and/or soil-like materials in remediation areas where total uranium is a WAC COC, excavation is planned, and material is designated for disposition in the OSDF.

Population of Soils:

Includes all at-and below-grade material (soils and soil-like materials) impacted with total uranium potentially exceeding the WAC and planned for disposition in the OSDF.

Scale of Decision Making

Areas designated for excavation will be evaluated as to whether the soil or soil-like material is below or above the OSDF WAC for total uranium. Excavation monitoring will be conducted on each excavation lift. Based on the information obtained as a result of reviewing and modeling existing data coupled with newly acquired excavation monitoring information, a decision will be made whether an individual excavation lift, or portion of a lift, meets or exceeds the OSDF WAC for total uranium.

Temporal Boundaries

Time frame: Real-time excavation monitoring information must be acquired and processed in time for review and use in decision making prior to excavation and disposition of excavated material.

Time Constraints on Monitoring: The scheduling of WAC excavation monitoring is directly tied to the excavation schedule. WAC excavation monitoring will be performed and a disposition decision made prior to excavation of each designated lift. Acquired information must be processed and reviewed by the project decision-makers prior to disposition of the lift being monitored. Time limits to complete

measurements are specified in the excavation subcontracts.

Practical Considerations: Weather, moisture, field conditions, and unforseen events affect the ability to perform excavation monitoring and meet the schedule. To maintain safe working conditions, excavation and construction activities will comply with all FEMP and project specific health and safety protocols.

5.0 Develop a Logic Statement

Parameter(s) of Interest

The parameter of interest is the concentration of total uranium in soil or soil-like material designated for disposition in the OSDF.

Waste Acceptance Criteria Concentration

The OSDF WAC concentration is 1,030 ppm for total uranium in soil and soil-like materials. This concentration is considered a NTE level for OSDF WAC attainment, and no analytical data point or real-time measurement, as defined by the instrument-specific threshold values, can meet or exceed this level in material destined for the OSDF.

Decision Rules

If excavation monitoring results are below the total uranium WAC for a specified volume of soil, then that soil is considered acceptable for final disposition in the OSDF. If monitoring results reveal soil concentrations at or above the total uranium WAC, as indicated by exceeding the instrument-specific threshold level, then the unacceptable soil must be delineated, removed, and segregated pending off-site disposal.

6.0 Limits on Decision Errors

Range of Parameter Limits

The area-specific total uranium soil concentrations anticipated in excavation areas will range from background levels (naturally-occurring soil concentrations) to concentrations greater than the total uranium WAC levels.

Types of Decision Errors and Consequences

Decision Error 1: This decision error occurs when the decision makers decide a specified volume of soil is below the WAC for total uranium, when in fact the uranium concentration in that soil is at or above the WAC. This error would result in soil or soil like material with concentrations above the WAC for total uranium being placed into the OSDF. Since the WAC is a NTE level, this error is unacceptable.

Decision Error 2: This decision error occurs when a volume of soil or soil like material is identified as above WAC, excavated, and sent for off-site disposition when the material is actually below the WAC for total uranium. This error would result in added costs due to the unnecessary segregation and off-site disposition of material that is acceptable for disposal in the OSDF.

True State of Nature for the Decision Errors

The true state of nature for Decision Error 1 is that the actual concentration of total uranium in a volume of soil is greater than the WAC. The true state of nature for Decision Error 2 is that the actual concentration of total uranium in a volume of soil is below the WAC. Decision Error 1 is the more severe error.

7.0 Design for Obtaining Quality Data

7.1 WAC Attainment Excavation Monitoring

WAC decision-making will be based on real-time excavation monitoring using the RMS systems. The sodium iodide system's threshold value (or trigger level) of 721 ppm for total uranium (70% of the 1,030 ppm WAC concentration for soil) is by agreement with the USEPA. Readings are obtained by RMS measurements using a spectral acquisition time of 4 seconds, and a detector speed of 1 mile per hour (mph) for each measurement. These parameters achieve the required sensitivity, and are the best compromise of practical considerations such as detector speed and time in the field. (For more detailed information reference the *RTRAK Applicability Study, 20701-RP-0003, Revision 1, PCN1, May 15, 1998.*) Thorium can cause interferences with the total uranium. Uranium results associated with Thorium values greater than 500 net counts per second will be reevaluated.

The HPGe system confirmation and delineation threshold value of 928 ppm for total uranium with a spectral acquisition time of 5 minutes (300 seconds) and variable detector heights will be used in soil and soil-like material. Lower (more conservative) threshold values may be defined in the PSP. (For more detailed information reference the *User Guidelines, Measurement Strageties, and Operational Factors for*

Deployment of In-Situ Gamma Spectrometry at the Fernald Site, 20701-RP-0006, Revision A, May 8, 1998.)

Real-time monitoring of each excavation lift will be accomplished using the RMS. In areas inaccessible to the RMS, HPGe detectors will be used. In the event the monitoring data exceeds either trigger level (see above), the entire vertical thickness (3 ± 1 foot) of the areal extent of above-WAC material will be removed and segregated pending off-site disposal. Confirmation measurements using HPGe detectors may be performed. If directed by the characterization lead, the HPGe detectors will be placed directly over the zone of maximum activity identified by the RMS and an additional 5 minute measurement will be taken. If the HPGe confirmation measurement exceeds 928 ppm for total uranium, then additional HPGe measurements may be required for further horizontal delineation (detector height may be adjusted to increase the field of view).

7.2 Interpretation of Results

The results obtained from real-time monitoring for purposes of WAC attainment will be compared to the published OSDF WAC concentration for total uranium. If results are equal to or greater than the WAC concentration (as defined by exceeding the specific threshold value level), the decision makers may take one of the following actions:

- Determine that the entire unit volume or "lift" subjected to excavation monitoring is at or above WAC and requires segregation pending off-site disposal.
- Based on adequacy of existing information (including visual inspection), excavate and segregate the portion of the lift material that is at or above WAC pending off-site disposition.
- Perform additional real-time monitoring to more accurately delineate the areal extent of above-WAC contamination. Using this information, define the extent of removal efforts to be conducted.

7.3 QC Considerations

The following data management requirements will be met prior to evaluation of acquired WAC attainment information:

1) An excavation monitoring form will be completed and reviewed in the field.

2) WAC data and decision-making information will be assigned to respective soil profiles, so characterization and tracking information can be maintained and retrieved.

3) The mobile sodium iodide systems will generate ASL level A data. The HPGe detectors can provide either ASL level A or B data. In order for real time data to be ASL B, it must meet the 10% data validation criterion in the SEP. Excavation monitoring data will be collected according to the applicable site procedures for the respective instrumentation.

4) When using the HPGe detectors, duplicate measurements will be taken at a frequency of one in twenty measurements or one per excavation lift, whichever is greater.

7.4 Independent Assessment

Independent assessment shall be performed by the FEMP QA organization by conducting surveillances. Surveillances shall be planned and documented in accordance with Section 12.3 of the SCQ.

7.5 Applicable Procedures

Real-time monitoring performed under the PSP shall follow the requirements outlined within the following procedures:

- ADM-16, In-Sutu Gamma Spectrometry Quality Control Measurements
- EQT-22, High Purity Germanium Detector In-Situ Efficiency Calibration
- EQT-23, Operation of ADCAM Series Analyzers with Gamma Sensitive Detectors
- EQT-32, Troxler 3440 Series Surface Moisture/Density Gauge
- EQT-39, Zeltex Infrared Moisture Meter
- EQT-33, Real-Time Differential Global Positioning System Operation
- EQT-41, Radiation Measurement Systems
- 20300-PL-002, Real Time Instrumentation Measurement Program Quality Assurance Plan
- EW-1022, On-Site Tracking and Manifesting of Bulk Impacted Material

7.6 References

- Sitewide CERCLA Quality Assurance Project Plan (SCQ), FD-1000, May 10 1995
- Sitewide Excavation Plan, July 1998, 2500-WP-0028, Revision 0
- Waste Acceptance Criteria Attainment Plan for the On-Site Disposal Facility, 20100-PL-0014, Rev.0, June 1998
- Impacted Materials Placement Plan for the On-Site Disposal Facility, January 1998, 20100-PL-007, Revision 0
- Area 2, Phase 1 Southern Waste Units Implementation Plan for Operational Unit 2, 2502-WP-0029, Revision 0, July 1998
- RTRAK Applicability Study, May 1998, 20701-RP-0003, Revision 1
- User Guidelines, Measurement Strategies, and Operational Factors for Deployment of In-Situ Gamma Spectrometry at the Fernald Site, July 1998, 20701-RP-0006 Revision B

Data Quality Objectives
Excavation Monitoring for Total Uranium Waste Acceptance Criteria (WAC)

1A. Task/Description: Waste Acceptance Criteria Monitoring

1.B. Project Phase: (Put an X in the appropriate selection.)

RI ☐ FS ☐ RD ☐ RA ☒ R_vA ☐ OTHER

1.C. DQO No.: SL-051 DQO Reference No.: N/A

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2. Media Characterization: (Put an X in the appropriate selection.)

Air ☐ Biological ☐ Groundwater ☐ Sediment ☐

Soil and Soil Like Material ☒

Waste ☐ Wastewater ☐ Surface water ☐ Other (specify) _____

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3. Data Use with Analytical Support Level (A-E): (Put an X in the appropriate Analytical Support Level selection(s) beside each applicable Data Use.)

Site Characterization A ☐ B ☐ C ☐ D ☐ E ☐	Risk Assessment A ☐ B ☐ C ☐ D ☐ E ☐
Evaluation of Alternatives A ☐ B ☐ C ☐ D ☐ E ☐	Engineering Design A ☐ B ☐ C ☐ D ☐ E ☐
Monitoring during remediation activities A ☐ B ☐ C ☐ D ☐ E ☐	Other Waste Acceptance Evaluation A ☒ B ☒ C ☐ D ☐ E ☐

4.A. Drivers: Specific construction work plans, Applicable or Relevant and Appropriate Requirements (ARARs) and Operable Unit 2 and Operable Unit 5 Records of Decision (ROD).

4.B. Objective: To provide data for identification of soils for compliance with Waste Acceptance Criteria.

5. Site Information (Description):

The RODs specify that FEMP soils will be below the WAC for disposal in the OSDF. WAC determination will be necessary for site soils that are scheduled for excavation and potential OSDF disposition.

6.A. Data Types with appropriate Analytical Support Level Equipment Selection and SCQ Reference: (Place an "X" to the right of the appropriate box or boxes selecting the type of analysis or analyses required. Then select the type of equipment to perform the analysis if appropriate. Please include a reference to the SCQ Section.)

1. pH	☐	2. Uranium	☒	3. BTX	☐
Temperature	☐	Full Radiological	☐	TPH	☐
Specific Conductance	☐	Metals	☐	Oil/Grease	☐
Dissolved Oxygen	☐	Cyanide	☐		
Technetium-99	☐	Silica	☐		
4. Cations	☐	5. VOA	☐	6. Other (specify)	☒
Anions	☐	BNA	☐	Thorium, Moisture	
TOC	☐	Pesticides	☐		
TCLP	☐	PCB	☐		
CEC	☐				
COD	☐				

6.B. Equipment Selection and SCQ Reference:

ASL A RMS SCQ Section: Section 3

ASL B HPGe SCQ Section: Section 3

ASL C _____ SCQ Section: _____

ASL D _____ SCQ Section: _____

ASL E _____ SCQ Section: _____

7.A. Sampling Methods: (Put an X in the appropriate selection.)

Biased	☐	Composite	☐	Environmental	☐	Grab	☐	Grid	☐
Intrusive	☐	Non-Intrusive	☒	Phased	☐	Source	☐		

DQO Number: SL-053

7.B. Sample Work Plan Reference: The DQO is being established prior to completion of the PSP.

Background samples: SED

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8. Quality Control Samples: (Place an "X" in the appropriate selection box.)

8.A. Field Quality Control Samples:

Trip Blanks	☐	Container Blanks	☐
Field Blanks	☐	Duplicate Measurements	☒*
Equipment Rinsate Samples	☐	Split Samples	☐
Preservative Blanks	☐	Performance Evaluation Samples	☐

Other (specify) _____

*For the HPGe detectors, duplicate measurements will be made every 1 in 20 or one per lift, whichever is greater.

8.B. Laboratory Quality Control Samples:

Method Blank	☐	Matrix Duplicate/Replicate	☐
Matrix Spike	☐	Surrogate Spikes	☐

Other (specify) Per method

9. Other: Please provide any other germane information that may impact the data quality or gathering of this particular objective, task or data use.

APPENDIX B

TARGET ANALYTE LISTS

2575

APPENDIX B

TARGET ANALYTE LISTS

TAL 20200-PSP-0003-A

Soil Analysis - ICP/MS and GPC		
1	ASL B	Total Uranium
2	ASL B	Technetium-99

TAL 20200-PSP-0003-B

Soil Analysis - ICP/MS		
1	ASL B	Total Uranium

TAL 20200-PSP-0003-C

Soil Analysis - Total VOCs		
1	ASL B	Bromodichloromethane
2	ASL B	Chloroethane
3	ASL B	1,1-Dichloroethene
4	ASL B	1,2-Dichloroethene
5	ASL B	Tetrachloroethene
6	ASL B	Trichloroethene
7	ASL B	Vinyl Chloride

TAL 20200-PSP-0003-D

Soil Analysis - Total SVOCs		
1	ASL B	Bis(2-chloroisopropyl)ether
2	ASL B	Carbazole
3	ASL B	4-Nitroaniline

TAL 20200-PSP-0003-E

Soil Analysis - Total Pesticides		
1	ASL B	Alpha-chlordane
2	ASL B	Toxaphene

TAL 20200-PSP-0003-F

Soil Analysis - TCLP VOCs		
1	ASL B	Benzene
2	ASL B	Carbon Tetrachloride
3	ASL B	Chlorobenzene
4	ASL B	Chloroform
5	ASL B	1,1-Dichloroethene
6	ASL B	1,2-Dichloroethane
7	ASL B	2-Butanone
8	ASL B	Tetrachloroethene
9	ASL B	Trichloroethene
10	ASL B	Vinyl Chloride

92

TAL 20200-PSP-0003-G

Soil Analysis - TCLP SVOCs, Pesticides, Herbicides		
1	ASL B	Chlordane
2	ASL B	o-Cresol
3	ASL B	m-Cresol
4	ASL B	p-Cresol
5	ASL B	2,4-D
6	ASL B	1,4-Dichlorobenzene
7	ASL B	2,4-Dinitrotoluene
8	ASL B	Endrin
9	ASL B	Heptachlor
10	ASL B	Heptachlor Epoxide
11	ASL B	Hexachlorobenzene
12	ASL B	Hexachlorobutadiene
13	ASL B	Hexachloroethane
14	ASL B	Lindane
15	ASL B	Methoxychlor
16	ASL B	Nitrobenzene
17	ASL B	Pentachlorophenol
18	ASL B	Pyridine
19	ASL B	Toxaphene
20	ASL B	2,4,5-Trichlorophenol
21	ASL B	2,4,6-Trichlorophenol
22	ASL B	2,4,5-TP (Silvex)

TAL 20200-PSP-0003-H

Soil Analysis - TCLP Metals		
1	ASL B	Arsenic
2	ASL B	Barium
3	ASL B	Cadmium
4	ASL B	Chromium
5	ASL B	Lead
6	ASL B	Mercury
7	ASL B	Selenium
8	ASL B	Silver

94

APPENDIX C

RANDOM PHYSICAL SOIL SAMPLES TO BE COLLECTED FOR THE SAMPLING OF REMOVAL ACTION 17 STOCKPILES 1, 2, AND 4 FOR OSDF WAC ATTAINMENT

APPENDIX C

RANDOM PHYSICAL SOIL SAMPLES TO BE COLLECTED FOR THE SAMPLING OF REMOVAL ACTION 17 STOCKPILES 1, 2, AND 4 FOR OSDF WAC ATTAINMENT

Sample ID	Northing	Easting	Boring Depth	Sample Depth (feet)[1]	Alternate Sample Depth (feet)[2]	Analysis
STOCKPILE 1						
SP1-1-R	481751	1349728	1.9'	0'-1.5'	0.4-1.9'	TAL A
SP1-1-L	481751	1349728	1.9'	0'-1.5'	0.4-1.9'	TAL C
SP1-1-P	481751	1349728	1.9'	0'-1.5'	0.4-1.9'	TAL E
SP1-1-TL	481751	1349728	1.9'	0'-1.5'	0.4-1.9'	TAL F
SP1-1-TS	481751	1349728	1.9'	0'-1.5'	0.4-1.9'	TAL G
SP1-1-TM	481751	1349728	1.9'	0'-1.5'	0.4-1.9'	TAL H
SP1-1-AB	481751	1349728	1.9'	0'-1.5'	0.4-1.9'	AB Screen
SP1-2-R	481782	1349720	2.5'	1.0'-2.5'	1.0'-2.5'	TAL A
SP1-2-L	481782	1349720	2.5'	1.0'-2.5'	1.0'-2.5'	TAL C
SP1-2-P	481782	1349720	2.5'	1.0'-2.5'	1.0'-2.5'	TAL E
SP1-2-TL	481782	1349720	2.5'	1.0'-2.5'	1.0'-2.5'	TAL F
SP1-2-TS	481782	1349720	2.5'	1.0'-2.5'	1.0'-2.5'	TAL G
SP1-2-TM	481782	1349720	2.5'	1.0'-2.5'	1.0'-2.5'	TAL H
SP1-2-AB	481782	1349720	2.5'	1.0'-2.5'	1.0'-2.5'	AB Screen
SP1-3-R	481818	1349736	4.8'	0'-1.5'	2.0'-3.5'	TAL A
SP1-3-L	481818	1349736	4.8'	0'-1.5'	2.0'-3.5'	TAL C
SP1-3-P	481818	1349736	4.8'	0'-1.5'	2.0'-3.5'	TAL E
SP1-3-TL	481818	1349736	4.8'	0'-1.5'	2.0'-3.5'	TAL F
SP1-3-TS	481818	1349736	4.8'	0'-1.5'	2.0'-3.5'	TAL G
SP1-3-TM	481818	1349736	4.8'	0'-1.5'	2.0'-3.5'	TAL H
SP1-3-AB	481818	1349736	4.8'	0'-1.5'	2.0'-3.5'	AB Screen
SP1-4-R	481851	1349715	2.2'	0'-1.5'	1.0'-2.5'	TAL A
SP1-4-L	481851	1349715	2.2'	0'-1.5'	1.0'-2.5'	TAL C

APPENDIX C

RANDOM PHYSICAL SOIL SAMPLES TO BE COLLECTED FOR THE SAMPLING OF REMOVAL ACTION 17 STOCKPILES 1, 2, AND 4 FOR OSDF WAC ATTAINMENT (continued)

Sample ID	Northing	Easting	Boring Depth	Sample Depth (feet)[1]	Alternate Sample Depth (feet)[2]	Analysis
SP1-4-P	481851	1349715	2.2'	0'-1.5'	1.0'-2.5'	TAL E
SP1-4-TL	481851	1349715	2.2'	0'-1.5'	1.0'-2.5'	TAL F
SP1-4-TS	481851	1349715	2.2'	0'-1.5'	1.0'-2.5'	TAL G
SP1-4-TM	481851	1349715	2.2'	0'-1.5'	1.0'-2.5'	TAL H
SP1-4-AB	481851	1349715	2.2'	0'-1.5'	1.0'-2.5'	AB Screen
SP1-5-R	481872	1349720	1.9'	0'-1.5'	1.0'-1.9'	TAL A
SP1-5-S	481872	1349720	1.9'	0'-1.5'	1.0'-1.9'	TAL D
SP1-5-AB	481872	1349720	1.9'	0'-1.5'	1.0'-1.9'	AB Screen
SP1-6-R	481747	1349768	1.0'	0'-1.0'	0'-1.0'	TAL A
SP1-7-R	481779	1349749	5.8'	4.0'-5.5'	2.0'-3.5'	TAL A
SP1-8-R	481819	1349788	0.6'	0'-0.6'	0'-0.6'	TAL A
SP1-9-R	481843	1349765	0.7'	0'-0.7'	0'-0.7'	TAL A
SP1-9-L	481843	1349765	0.7'	0'-0.7'	0'-0.7'	TAL C
SP1-9-P	481843	1349765	0.7'	0'-0.7'	0'-0.7'	TAL E
SP1-9-TL	481843	1349765	0.7'	0'-0.7'	0'-0.7'	TAL F
SP1-9-TS	481843	1349765	0.7'	0'-0.7'	0'-0.7'	TAL G
SP1-9-TM	481843	1349765	0.7'	0'-0.7'	0'-0.7'	TAL H
SP1-9-AB	481843	1349765	0.7'	0'-0.7'	0'-0.7'	AB Screen
SP1-10-R	481862	1349750	1.5'	0'-1.5'	0'-1.5'	TAL A
STOCKPILE 2						
SP2-1-R	482134	1348617	1.5'	0'-1.5'	0'-1.5'	TAL A
SP2-1-S	482134	1348617	1.5'	0'-1.5'	0'-1.5'	TAL D
SP2-1-AB	482134	1348617	1.5'	0'-1.5'	0'-1.5'	AB Screen

97

APPENDIX C

RANDOM PHYSICAL SOIL SAMPLES TO BE COLLECTED FOR THE SAMPLING OF REMOVAL ACTION 17 STOCKPILES 1, 2, AND 4 FOR OSDF WAC ATTAINMENT (continued)

Sample ID	Northing	Easting	Boring Depth	Sample Depth (feet)[1]	Alternate Sample Depth (feet)[2]	Analysis
SP2-2-R	482147	1348650	8.5'	4.0'-5.5'	0'-1.5'	TAL A
SP2-3-R	482148	1348676	9.0'	7.0'-8.5'	7.0'-8.5'	TAL A
SP2-4-R	482158	1348734	1.8'	0'-1.5'	0'-1.5'	TAL A
SP2-5-R	482166	1348652	9.2'	8.0'-9.2'	7.0'-8.5'	TAL A
SP2-6-R	482175	1348695	10.1'	7.0'-8.5'	7.0'-8.5'	TAL A
SP2-7-R	482175	1348725	6.4'	5.0'-6.4'	0'-1.5'	TAL A
SP2-8-R	482196	1348651	6.3'	3.0'-4.5'	5.0'-6.3'	TAL A
SP2-9-R	482196	1348677	9.2'	3.0'-4.5'	6.0'-7.5'	TAL A
SP2-10-R	482206	1348725	2.9'	0'-1.5'	0'-1.5'	TAL A
STOCKPILE 4						
SP4-1-R	481774	1349368	3.1'	1.6'-3.1'	0'-1.5'	TAL A
SP4-1-L	481774	1349368	3.1'	1.6'-3.1'	0'-1.5'	TAL C
SP4-1-P	481774	1349368	3.1'	1.6'-3.1'	0'-1.5'	TAL E
SP4-1-TL	481774	1349368	3.1'	1.6'-3.1'	0'-1.5'	TAL F
SP4-1-TS	481774	1349368	3.1'	1.6'-3.1'	0'-1.5'	TAL G
SP4-1-TM	481774	1349368	3.1'	1.6'-3.1'	0'-1.5'	TAL H
SP4-1-AB	481774	1349368	3.1'	1.6'-3.1'	0'-1.5'	AB Screen
SP4-2-R	481781	1349400	6.5'	4.0'-5.5'	1.0'-2.5'	TAL A
SP4-3-R	481782	1349472	0.7'	0'-0.7'	0'-0.7'	TAL A
SP4-3-L	481782	1349472	0.7'	0'-0.7'	0'-0.7'	TAL C
SP4-3-P	481782	1349472	0.7'	0'-0.7'	0'-0.7'	TAL E
SP4-3-TL	481782	1349472	0.7'	0'-0.7'	0'-0.7'	TAL F
SP4-3-TS	481782	1349472	0.7'	0'-0.7'	0'-0.7'	TAL G

APPENDIX C

RANDOM PHYSICAL SOIL SAMPLES TO BE COLLECTED FOR THE SAMPLING OF REMOVAL ACTION 17 STOCKPILES 1, 2, AND 4 FOR OSDF WAC ATTAINMENT (continued)

Sample ID	Northing	Easting	Boring Depth	Sample Depth (feet)[1]	Alternate Sample Depth (feet)[2]	Analysis
SP4-3-TM	481782	1349472	0.7'	0'-0.7'	0'-0.7'	TAL H
SP4-3-AB	481782	1349472	0.7'	0'-0.7'	0'-0.7'	AB Screen
SP4-4-R	481827	1349353	1.9'	0'-1.5'	0.5'-1.9'	TAL A
SP4-4-L	481827	1349353	1.9'	0'-1.5'	0.5'-1.9'	TAL C
SP4-4-P	481827	1349353	1.9'	0'-1.5'	0.5'-1.9'	TAL E
SP4-4-TL	481827	1349353	1.9'	0'-1.5'	0.5'-1.9'	TAL F
SP4-4-TS	481827	1349353	1.9'	0'-1.5'	0.5'-1.9'	TAL G
SP4-4-TM	481827	1349353	1.9'	0'-1.5'	0.5'-1.9'	TAL H
SP4-4-AB	481827	1349353	1.9'	0'-1.5'	0.5'-1.9'	AB Screen
SP4-5-R	481800	1349395	11.9'	2.0'-3.5'	2.0'-3.5'	TAL A
SP4-6-R	481805	1349429	11.4'	2.0'-3.5'	9.0'-10.5'	TAL A
SP4-6-L	481805	1349429	11.4'	2.0'-3.5'	9.0'-10.5'	TAL C
SP4-6-P	481805	1349429	11.4'	2.0'-3.5'	9.0'-10.5'	TAL E
SP4-6-TL	481805	1349429	11.4'	2.0'-3.5'	9.0'-10.5'	TAL F
SP4-6-TS	481805	1349429	11.4'	2.0'-3.5'	9.0'-10.5'	TAL G
SP4-6-TM	481805	1349429	11.4'	2.0'-3.5'	9.0'-10.5'	TAL H
SP4-6-AB	481805	1349429	11.4'	2.0'-3.5'	9.0'-10.5'	AB Screen
SP4-7-R	481813	1349469	3.0'	1.5'-3.0'	1.5'-3.0'	TAL A
SP4-7-S	481813	1349469	3.0'	1.5'-3.0'	1.5'-3.0'	TAL D
SP4-7-AB	481813	1349469	3.0'	1.5'-3.0'	1.5'-3.0'	AB Screen
SP4-8-R	481852	1349383	2.7'	0'-1.5'	0'-1.5'	TAL A
SP4-9-R	481855	1349420	3.4'	0'-1.5'	0'-1.5'	TAL A
SP4-9-L	481855	1349420	3.4'	0'-1.5'	0'-1.5'	TAL C

APPENDIX C

RANDOM PHYSICAL SOIL SAMPLES TO BE COLLECTED FOR THE SAMPLING OF REMOVAL ACTION 17 STOCKPILES 1, 2, AND 4 FOR OSDF WAC ATTAINMENT (continued)

Sample ID	Northing	Easting	Boring Depth	Sample Depth (feet)[1]	Alternate Sample Depth (feet)[2]	Analysis
SP4-9-P	481855	1349420	3.4'	0'-1.5'	0'-1.5'	TAL E
SP4-9-TL	481855	1349420	3.4'	0'-1.5'	0'-1.5'	TAL F
SP4-9-TS	481855	1349420	3.4'	0'-1.5'	0'-1.5'	TAL G
SP4-9-TM	481855	1349420	3.4'	0'-1.5'	0'-1.5'	TAL H
SP4-9-AB	481855	1349420	3.4'	0'-1.5'	0'-1.5'	AB Screen
SP4-10-R	481832	1349427	10.4'	9.0'-10.4'	3.0'-4.5'	TAL A

[1] The sample depth in feet is calculated for the boring located at the coordinates given in this table. If the boring is moved greater than 3 feet due to accessibility or refusal, a new depth in feet will be calculated based on the same random percentage and the height of the pile at the new location.

[2] The alternate sample depth is used only if the sample cannot be collected at the primary relative depth fraction due to poor sample recovery. If the primary random depth cannot be collected and the alternate random depth is shallower and has already been discarded, the alternate random depth interval will be collected from any additional borings attempted.

APPENDIX D

SUMMARY OF EXISTING DATA ON SP-1, SP-2, AND SP-4

TABLE D-1
SUMMARY OF EXISTING DATA ON SP-1

SP-1 TOTAL URANIUM RESULTS

Total Uranium	98.8 ppm	Total Uranium	47.1 ppm
Total Uranium	77.8 ppm	Total Uranium	40.6 ppm
Total Uranium	75 ppm	Total Uranium	32.9 ppm
Total Uranium	69.4 ppm	Total Uranium	26 ppm
Total Uranium	66.7 ppm	Total Uranium	17.7 ppm
Total Uranium	60.3 ppm	Total Uranium	11.5 ppm
Total Uranium	47.1 ppm		

SUMMARY OF SP-1 TCLP RESULTS
(based on results of 13 samples)

Benzene	<0.010 ppm	Heptachlor	<0.00005 ppm
Bis(2-chloroisopropyl)ether	<0.010 ppm	Hexachlorobenzene	<0.010 ppm
Bromodichloromethane	<0.010 ppm	Hexachlorobutadiene	<0.010 ppm
Carbazole	<0.010 ppm	Hexachloroethane	<0.010 ppm
Carbon Tetrachloride	<0.010 ppm	Lindane	<0.010 ppm
Chlordane	<0.00005 ppm	Methoxychlor	<0.00005 ppm
Chlorobenzene	<0.010 ppm	Methyl Ethyl Ketone	0.011 ppm
Chloroethane	<0.010 ppm	4-Nitroaniline	<0.025 ppm
Chloroform	<0.010 ppm	Nitrobenzene	<0.010 ppm
o-Cresol	<0.010 ppm	Pentachlorophenol	<0.010 ppm
—Cresol	<0.010 ppm	Pyridine	<0.010 ppm
p-Cresol	<0.010 ppm	Tetrachloroethene	0.005 ppm
2,4-D	<0.010 ppm	Toxaphene	<0.005 ppm
1,4-Dichlorobenzene	<0.010 ppm	2,4,5-TP (Silvex)	<0.010 ppm
1,2-Dichloroethane	<0.010 ppm	Trichloroethene	<0.010 ppm
1,1-Dichloroethene	<0.010 ppm	2,4,5-Trichlorophenol	<0.025 ppm
1,2-Dichloroethene	<0.010 ppm	2,4,6-Trichlorophenol	<0.010 ppm
2,4-Dinitrotoluene	<0.010 ppm	Vinyl Chloride	<0.010 ppm
Endrin	<0.0001 ppm		

SUMMARY OF SP-1 TOTAL METALS RESULTS
(based on results of 13 samples)

Arsenic	5.6 ppm	Lead	50 ppm
Barium	112.3 ppm	Mercury	0.273 ppm
Cadmium	1.1 ppm	Selenium	<20 ppm
Chromium	33 ppm	Silver	<2 ppm

TABLE D-2
SUMMARY OF EXISTING DATA ON SP-2

SP-2 TOTAL URANIUM RESULTS

Total Uranium	154 ppm	Total Uranium	43.5 ppm
Total Uranium	132 ppm	Total Uranium	24 ppm
Total Uranium	121 ppm	Total Uranium	15.3 ppm
Total Uranium	70.6 ppm	Total Uranium	<11 ppm
Total Uranium	69.6 ppm	Total Uranium	<11 ppm
Total Uranium	52.9 ppm		

SUMMARY OF SP-2 TCLP ORGANICS RESULTS
(based on results of 44 samples)

Benzene	<0.08 ppm	Hexachlorobutadiene	<0.04 ppm
Carbon Tetrachloride	<0.08 ppm	Hexachloroethane	<0.04 ppm
Chlorobenzene	<0.17 ppm	Methyl Ethyl Ketone (2-Butanone)	<0.33 ppm
Chloroform	<0.08 ppm	Nitrobenzene	<0.04 ppm
o-Cresol	<0.04 ppm	Pentachlorophenol	<0.04 ppm
m-Cresol	<0.04 ppm	Pyridine	<0.04 ppm
p-Cresol	<0.04 ppm	Tetrachloroethene	<0.08 ppm
1,4-Dichlorobenzene	<0.17 ppm	Trichloroethene	<0.08 ppm
1,2-Dichloroethane	<0.08 ppm	2,4,5-Trichlorophenol	<0.04 ppm
1,1-Dichloroethene	<0.08 ppm	2,4,6-Trichlorophenol	<0.04 ppm
2,4-Dinitrotoluene	<0.04 ppm	Vinyl Chloride	<0.17 ppm
Hexachlorobenzene	<0.04 ppm		

SUMMARY OF SP-2 TCLP METALS RESULTS
(based on results of 11 samples)

Arsenic	<0.02 ppm	Lead	0.073 ppm
Barium	1.18 ppm	Mercury	<0.001 ppm
Cadmium	<0.02 ppm	Selenium	<0.01 ppm
Chromium	<0.09 ppm	Silver	<0.05 ppm

TABLE D-3
SUMMARY OF EXISTING DATA ON SP-4

Existing data on SP-4 was summarized in Table 2-2 of the Sitewide Excavation Plan (2500-WP-0028, July 1998), which is reproduced here for reference.

TABLE 2-2

USTs TO BE CLOSED UNDER CERCLA

TANK ID	DESCRIPTION	FORMER CONTENTS	STATUS & DESCRIPTION OF CLOSURE ACTIVITIES
TANKS CLOSED BY REMOVAL – DEMONSTRATION OF SOIL FRLs ATTAINMENT NEEDED			
RAILROAD ENGINE HOUSE - BUILDING 24B			
UST-3	**Remediation Area:** 3 **Former Location:** 25 feet NE of Railroad Engine House (Bldg. 24B) **Fomer Volume:** 12,500 gallons **Former Size:** 10 foot diameter x 21 foot length; steel **Former Accessories:** Pump located immediately S of tank	**Material:** Diesel Fuel **COCs:** Benzene . . . . . (FRL; no OSDF WAC) Ethylbenzene . . . . . (FRL; no OSDF WAC) Toluene . . . . . (FRL; no OSDF WAC) Xylene . . . . . (FRL; no OSDF WAC) Barium . . . . . (FRL; no OSDF WAC) Lead . . . . . (FRL; no OSDF WAC) Mercury . . . . . (FRL; OSDF WAC) **Reference MEFs:** 203, 584	**REMOVED – UST Removal Action appears to meet FRL criteria; Demonstration of Soil FRLs Attainment Needed.** Tank removed. Soil samples taken during tank removal had elevated concentrations of BETX, TPH and Lead. An additional 530 cubic yards of soil was removed from the UST-3 pit based on visual staining, petroleum odors and headspace analysis vs. background. Hydrocarbon contamination also found under train tracks in upper 3 feet of soil (tracks ran to W side of pit to engine house and E side pit) and soil was excavated to headspace criteria. Excavation was backfilled with clean gravel. Results from post-excavation soil sampling conducted at 20-foot intervals. Results for Lead (<4.7-12 mg/kg) were below the established FRL; BETX constituents were not detected; TPH was 28-112 mg/kg (no FRL established). [Source: UST-3 Tank Closeout Report (DOE 1992a)].

TABLE 2-2
(Continued)

TANK ID	DESCRIPTION	FORMER CONTENTS	STATUS & DESCRIPTION OF CLOSURE ACTIVITIES
MAINTENANCE SHOP - BUILDING 12			
UST-6	**Remediation Area:** 3 **Former Location:** 1 foot N of Maintenance Shop (Bldg. 12) **Former Volume:** 1,000 gallons **Former Size:** 4 foot diameter x 12 foot length; steel **Former Accessories:** N/A	**Material:** Gasoline **COCs:** Acetone . . . . . (FRL; no OSDF WAC) Benzene . . . . . (FRL; no OSDF WAC) Carbon Tetrachloride . . . . . (FRL; no OSDF WAC) 1,2-Dichloroethane . . . . . (FRL; no OSDF WAC) 1,1-Dichloroethene . . . . . (FRL; OSDF WAC) Ethylbenzene . . . . . (FRL; no OSDF WAC) Methyl Chloride . . . . . (no FRL; no OSDF WAC) Methyl Ethyl Ketone . . . . . (no FRL; no OSDF WAC) Tetrachloroethene . . . . . (FRL; OSDF WAC) Toluene . . . . . (FRL; no OSDF WAC) 1,1,1-Trichloroethane . . . . (no FRL; no OSDF WAC) Trichloroethene . . . . . (FRL; OSDF WAC) Xylene . . . . . (FRL; no OSDF WAC) Arsenic . . . . . (FRL; no OSDF WAC) Cadmium . . . . . (FRL; no OSDF WAC) Chromium . . . . . (FRL as VI; no OSDF WAC) Lead . . . . . (FRL; no OSDF WAC) Mercury . . . . . (FRL; OSDF WAC) Selenium . . . . . (FRL; no OSDF WAC) **Reference MEFs:** 501, 1616, 1618, 1672, 2746, 10026	**REMOVED — UST Removal Action appears to meet FRL criteria; Demonstration of Soil FRLs Attainment Needed.** Tank removed. Analytical results from 3 soil samples collected (selected based on highest PID levels) from the excavation indicated Lead (5.98-8.85 mg/kg), Toluene (5.4 μg/kg) and Xylene (11.8 μg/kg) are below established FRLs; Benzene (< 5.0 μg/kg) and Ethylbenzene (<5.0 μg/kg) were below detection limits, and below established FRLs; TPH was <10.0 mg/kg (no FRL established). [Source: Closure Assessment Report for Petroleum USTs (DOE 1991a)].

TABLE 2-2
(Continued)

TANK ID	DESCRIPTION	FORMER CONTENTS	STATUS & DESCRIPTION OF CLOSURE ACTIVITIES
PLANT 1 TRUCK DOCK			
UST-11	**Remediation Area:** 4b **Former Location:** Buried under gravel approximately 6 feet E of Plant 1 Truck Dock and S of Bldg. 1. Also 2 feet N of UST-12 and 2 feet S of Plant 1 cyclone fence. **Former Volume:** 3,000 gallons **Former Size:** 5½ foot diameter x 18 foot length; steel **Former Accessories:** Tank piping ran N under cyclone fence, then approximately 10 feet to gas pump.	**Material:** Kerosene, Gasoline **COCs:** Benzene . . . . . (FRL; no OSDF WAC) Ethylbenzene . . . . . (FRL; no OSDF WAC) Methyl Isobutyl Ketone . . . (no FRL; no OSDF WAC) Toluene . . . . . (FRL; no OSDF WAC) 1,1,1-Trichloroethane . . . . (no FRL; no OSDF WAC) Xylene . . . . . (FRL; no OSDF WAC) Arsenic . . . . . (FRL; no OSDF WAC) Barium . . . . . (FRL; no OSDF WAC) Chromium . . . . . (FRL as VI; no OSDF WAC) Lead . . . . . (FRL; no OSDF WAC) Mercury . . . . . (FRL; OSDF WAC) Selenium . . . . . (FRL; no OSDF WAC) **Reference MEFs:** 345, 492, 1408	**REMOVED — Demonstration of Soil FRLs Attainment Needed.** USTs-11, -12, and -13 were in poor condition upon removal. Soils surrounding USTs -11, -12, and -13 were sampled in 1990 upon completion of tank removal. Results for Benzene (342 μg/kg), Toluene (519 μg/kg), Ethylbenzene (2,920 μg/kg), Xylene (11,400 μg/kg), and Lead (19.7 mg/kg) are below established FRLs; maximum TPH was 1,810 mg/kg (no FRL established). [Source: Underground Storage Tanks Removal Site Evaluation (DOE 1991b)]. In 1991, additional soil excavation extended to approximately 11 feet deep and horizontally until structural constraints or non-petroleum hydrocarbon contamination discovered - 5,000 square feet with estimated volume of 2,000 cubic yards of soil. *No soil sampling conducted following 1991 excavation.* [Source: USTs-11, -12 and -13 Closure Report (DOE 1993c)]. The following is from R.E. Tiller 2/11/1992 letter to USEPA & OEPA: *During 1991 excavation, pocket of fly ash and rubble found approximately 50 feet E of tank cluster at 9 foot depth. Inconsistent organic vapor reading led to soil sampling. Results indicated presence of acetone and methanol* (could not find results in file) [NOTE: Acetone—FRL; no OSDF WAC; Methanol—no FRL; no OSDF WAC]. Also evidence of petroleum-contaminated soils underneath Plant 1 Truck Dock.

TABLE 2-2
(Continued)

TANK ID	DESCRIPTION	FORMER CONTENTS	STATUS & DESCRIPTION OF CLOSURE ACTIVITIES
UST-12	**Remediation Area:** 4b **Former Location:** Approximately 6 feet E of Plant 1 Truck Dock and S of Bldg. 1. Also 2 feet S of UST-11. **Former Volume:** 3,000 gallons **Former Size:** 5½ foot diameter x 18 foot length; steel **Former Accessories:** Tank piping ran across UST-11, under cyclone fence, then approximately 10 feet to gas pump.	**Material:** Gasoline **COCs:** Benzene . . . . . (FRL; no OSDF WAC) Lead . . . . . (FRL; no OSDF WAC) **Reference MEFs:** 492, 6055	**REMOVED — Demonstration of Soil FRLs Attainment Needed.** See entry for UST-11.
UST-13	**Remediation Area:** 4b **Former Location:** Approximately 25 feet E of Plant 1 Truck Dock and 40 feet S of Bldg. 1 cyclone fence. **Former Volume:** 3,000 gallons **Former Size:** 5½ foot diameter x 18 foot length; steel **Former Accessories:** Pump and remote fill at N end of paved road S of tank	**Material:** Kerosene, Gasoline **COCs:** Benzene . . . . . (FRL; no OSDF WAC) Ethylbenzene . . . . . (FRL; no OSDF WAC) Methyl Isobutyl Ketone . . . (no FRL; no OSDF WAC) Toluene . . . . . (FRL; no OSDF WAC) 1,1,1-Trichloroethane . . . . . (FRL; no OSDF WAC) Xylene . . . . . (FRL; no OSDF WAC) Arsenic . . . . . (FRL; no OSDF WAC) Barium . . . . . (FRL; no OSDF WAC) Chromium . . . . . (FRL; no OSDF WAC) Lead . . . . . (FRL; no OSDF WAC) Mercury . . . . . (FRL; OSDF WAC) Selenium . . . . . (FRL; no OSDF WAC) **Reference MEFs:** 345, 492, 1408	**REMOVED — Demonstration of Soil FRLs Attainment Needed.** See entry for UST-11.

TABLE 2-2
(Continued)

TANK ID	DESCRIPTION	FORMER CONTENTS	STATUS & DESCRIPTION OF CLOSURE ACTIVITIES
GARAGE - BUILDING 31			
UST-1	**Remediation Area:** 5 **Former Location:** Centerline approximately 51 feet E of Garage (Bldg. 31). Tank was buried approximately 1½ feet beneath a ½ foot concrete slab. **Former Volume:** 1,500 gallons **Former Size:** 8 foot diameter spherical tank; fiberglass **Former Accessories:** Piping from top of UST-1 to aboveground gasoline pumps and a 2 inch vent line from UST-1 to UST-2 and to Bldg. 31.	**Material:** Unleaded Gasoline **COCs:** Benzene . . . . . (FRL; no OSDF WAC) Ethylbenzene . . . . . (FRL; no OSDF WAC) Toluene . . . . . (FRL; no OSDF WAC) Xylene . . . . . (FRL; no OSDF WAC) Barium . . . . . (FRL; no OSDF WAC) Lead . . . . . (FRL; no OSDF WAC) Mercury . . . . . (FRL; OSDF WAC) **Reference MEFs:** 181, 60053	**REMOVED — UST Removal Action appears to meet FRL criteria; Demonstration of Soil FRLs Attainment Needed.** USTs -1, -2, -8, -9, -10 removed in concert. Soil excavated to maximum depth of 11 feet within footprint of the 5 tank cluster. Horizontal excavation continued until a physical constraint was encountered. Final excavation covered approximately 6,000 square feet of surface area. Excavated volume estimated at 2,500 cubic yards of soil. 9 soil samples (based on highest PID levels) were collected in 1990 when the tanks were removed but prior to final soil excavation. Results for Benzene (1,210 μg/kg), Toluene (382 μg/kg), Ethylbenzene (1,190 μg/kg), Xylene (1,1300 μg/kg), and Lead (35.6 mg/kg) are below established FRLs; TPH was 656 mg/kg (no FRL established). *No samples were collected during excavation; no post-excavation samples were collected.* USTs-1, -2, -8, -9 and -10 Closure Report (DOE 1993d) concluded that only minor residual petroleum contamination remained after excavation. Since USTs were located in an area with significant uranium contamination and further excavation was impractical, any additional remediation would be conducted under CERCLA.
UST-2	**Remediation Area:** 5 **Former Location:** Centerline approximately 51 feet E of Garage (Bldg. 31). Tank was buried approximately 1½ feet beneath a ½ foot concrete slab. **Former Volume:** 1,500 gallons **Former Size:** 8 foot diameter spherical tank; fiberglass **Former Accessories:** Piping from top of tank to aboveground gasoline pumps and 2 inch vent line from UST-2 to UST-1	**Material:** Unleaded Gasoline **COCs:** Benzene . . . . . (FRL; no OSDF WAC) Ethylbenzene . . . . . (FRL; no OSDF WAC) Toluene . . . . . (FRL; no OSDF WAC) Xylene . . . . . (FRL; no OSDF WAC) Barium . . . . . (FRL; no OSDF WAC) Lead . . . . . (FRL; no OSDF WAC) Mercury . . . . . (FRL; OSDF WAC) **Reference MEFs:** 181, 60053	**REMOVED — UST Removal Action appears to meet FRL criteria; Demonstration of Soil FRL Attainment Needed.** See entry for UST-1.

1-2575

107

TABLE 2-2
(Continued)

TANK ID	DESCRIPTION	FORMER CONTENTS	STATUS & DESCRIPTION OF CLOSURE ACTIVITIES
UST-8	**Remediation Area:** 5 **Former Location:** 12 feet NE of Garage (Bldg. 31). Tank was buried under 8 inch concrete slab with 2 foot x 2 foot 8 inch concrete dispensing pump foundation extending above pavement at N end of tank. **Former Volume:** 1,000 gallons **Former Size:** 4 foot diameter x 12 foot length; steel **Former Accessories:** Remote fill line ran from tank to 10 feet W of tank	**Material:** Leaded Gasoline COCs: Acetone . . . . . (FRL; no OSDF WAC) Benzene . . . . . (FRL; no OSDF WAC) Ethylbenzene . . . . . (FRL; no OSDF WAC) Methyl Ethyl Ketone . . . . . (no FRL; no OSDF WAC) Toluene . . . . . (FRL; no OSDF WAC) Xylene . . . . . (FRL; no OSDF WAC) Arsenic . . . . . (FRL; no OSDF WAC) Selenium . . . . . (FRL; no OSDF WAC) **Reference MEFs:** 183, 487	**REMOVED – UST Removal Action appears to meet FRL criteria; Demonstration of Soil FRLs Attainment Needed.** See entry for UST-1.
UST-9	**Remediation Area:** 5 **Former Location:** 8½ feet from NE corner of Garage (Bldg. 31). ¾ of tank was buried under an 8 inch concrete pad. **Former Volume:** 1,000 gallons **Former Size:** 4 foot diameter x 12 foot length; steel **Former Accessories:** Remote fill line - tank to E wall of garage	**Material:** Diesel Fuel COCs: Acetone . . . . . (FRL; no OSDF WAC) Benzene . . . . . (FRL; no OSDF WAC) Ethylbenzene . . . . . (FRL; no OSDF WAC) Methyl Ethyl Ketone . . . . . (no FRL; no OSDF WAC) Toluene . . . . . (FRL; no OSDF WAC) Xylene . . . . . (FRL; no OSDF WAC) Arsenic . . . . . (FRL; no OSDF WAC) Selenium . . . . . (FRL; no OSDF WAC) **Reference MEFs:** 131, 487, 60331	**REMOVED – UST Removal Action appears to meet FRL criteria; Demonstration of Soil FRL Attainment Needed.** See entry for UST-1.

TABLE 2-2
(Continued)

TANK ID	DESCRIPTION	FORMER CONTENTS	STATUS & DESCRIPTION OF CLOSURE ACTIVITIES
UST-10	**Remediation Area:** 5 **Former Location:** Centerline approx. 43½ feet E of Garage (Bldg. 31). Tank was buried beneath 2 gas pumps on concrete pad. **Former Volume:** 3,000 gallons **Former Size:** 5½ foot diameter x 18 foot length; steel **Former Accessories:** Concrete pump island with 2 pumps directly over tank	**Material:** Leaded Gasoline **COCs:** Acetone . . . . . (FRL; no OSDF WAC) Methylene Chloride . . . . . (FRL; no OSDF WAC) Trichlorofluoromethane . . . (no FRL; no OSDF WAC) Barium . . . . . (FRL; no OSDF WAC) Lead . . . . . (FRL; no OSDF WAC) **Reference MEFs:** N/A; See MSDS	**REMOVED — UST Removal Action appears to meet FRL criteria; Demonstration of Soil FRLs Attainment Needed.** See entry for UST-1.

TABLE 2-2
(Continued)

TANK ID	DESCRIPTION	FORMER CONTENTS	STATUS & DESCRIPTION OF CLOSURE ACTIVITIES
UST-5	**Remediation Area:** 5 **Former Location:** Approximately 10 feet E of Garage (Bldg. 31). **Former Volume:** 200 gallons **Former Size:** 2½ foot diameter x 6 foot length; steel	**Material:** Wastewater from Oil/Water Separator - contained hydraulic oil, motor oil, gasoline, diesel fuel and cleaning solvents (such as 1,1,1-Trichloroethane @ 6.3-6.9 mg/kg) **COCs:** Acetone . . . . . (FRL; no OSDF WAC) Aroclors/PCBs . . . . . (FRL; no OSDF WAC) Benzene . . . . . (FRL; no OSDF WAC) Carbon Tetrachloride . . . . . (FRL; no OSDF WAC) Cyclohexanone . . . . . (no FRL; no OSDF WAC) 1,2-Dichloroethane . . . . . (FRL; no OSDF WAC) 1,1-Dichloroethene . . . . . (FRL; OSDF WAC) Ethylbenzene . . . . . (FRL; no OSDF WAC) Ethyl Ether . . . . . (no FRL; no OSDF WAC) Methylene Chloride . . . . . (FRL; no OSDF WAC) Methyl Ethyl Ketone . . . . . (FRL; no OSDF WAC) Methyl Isobutyl Ketone . . . (no FRL; no OSDF WAC) Tetrachloroethene . . . . . (FRL; OSDF WAC) Toluene . . . . . (FRL; no OSDF WAC) 1,1,1-Trichloroethane . . . . (no FRL; no OSDF WAC) Trichloroethene . . . . . (FRL; OSDF WAC) Trifluorochloromethane . . . (no FRL; no OSDF WAC) Xylene . . . . . (FRL; no OSDF WAC) Arsenic . . . . . (FRL; no OSDF WAC) Barium . . . . . (FRL; no OSDF WAC) Cadmium . . . . . (FRL; no OSDF WAC) Chromium . . . . . (FRL as VI; no OSDF WAC) Lead . . . . . (FRL; no OSDF WAC) Mercury . . . . . (FRL; OSDF WAC) Selenium . . . . . (FRL; no OSDF WAC) Silver . . . . . (FRL; no OSDF WAC) **Reference MEFs:** 386, 1616, 1618, 1672, 1832, 10026, 10031, 30046, 60115, 60329, 60342	**REMOVED – UST Removal Action appears to meet FRL criteria; Demonstration of Soil FRLs Attainment Needed.** Tank reclassified from HWMU to SWMU (based on Waste Water Treatment Unit exemption); tank removed; soil removed during tank excavation was placed back into hole because no visibly contaminated soils were present [Source: USTs-5, -7, -14 and -17 Closeout Report (DOE 1995h)]. Soil samples were collected in 3/1990 after rainwater flowed into the tank after it had been uncovered. These sampling results were erroneously summarized in the UST-5 Removal Site Evaluation (RSE) (DOE 1993e) and USTs-5, -7, -14 and -17 Closeout Report (DOE 1995h). Review of analytical data indicates that results for rain water in tank and soil were switched in Table 1 of the RSE (and carried over into Closeout Report). As a result, these reports state that 1,1,1-Trichloroethane was detected in soils when the analytical data from the laboratory reports (included as Attachment 1 of the RSE) indicates that it was not detected. Results for Xylene (32 μg/kg), Barium (100 mg/kg), Arsenic (5.50 mg/kg), Cadmium (0.285 mg/kg), Chromium (20.7 mg/kg), Lead (11.1 mg/kg), and Silver (0.119 mg/kg) are below established FRLs; Benzene, Ethylbenzene and Toluene were not detected; Methanol (195 μg/kg) was detected but has no established FRL. No other semi-volatile or volatile organic compounds were detected in the soil.

TABLE 2-2
(Continued)

TANK ID	DESCRIPTION	FORMER CONTENTS	STATUS & DESCRIPTION OF CLOSURE ACTIVITIES
HEAVY EQUIPMENT BUILDING - BUILDING 46			
UST-17	**Remediation Area:** 5 **Former Location:** Approximately 10 feet N of Heavy Equipment Building (Bldg. 46). **Former Volume:** 200 gallons **Former Size:** 2½ foot diameter x 6 foot length; steel	**Material:** Waste Oil from Oil/Water Separator **COCs:** Acetone . . . . . (FRL; no OSDF WAC) 1,1,1-Trichloroethane . . . . . (FRL; no OSDF WAC) Barium . . . . . (FRL; no OSDF WAC) Selenium . . . . . (FRL; no OSDF WAC) **Reference MEFs:** 123, 124, 60035 **SWMU - Not regulated by BUSTR**	**REMOVED — Demonstration of Soil FRsL Attainment Needed.** Tank and concrete slab above tank was removed (slab was at 8 foot depth) - tank was in very poor condition and, upon removal, water inside tank emptied into the excavation (water accumulated after tank was emptied of its contents). Water in excavation was immediately removed and drummed. Soils that came into contact with water or that were discolored were excavated — 3 drums with Lot code W050-741-P011-0395. [Source: USTs-5, -7, -14 and -17 Closeout Report (DOE 1995h)]. Soil samples were collected prior to excavation. Results for Xylene (27 μg/kg) and Lead (29.7 mg/kg) were below established FRLs; Benzene, Toluene and Ethylbenzene were not detected; maximum TPH was 3,300 mg/kg (no FRL established); no other volatile or semi-volatile organic compounds were detected in the soil samples. Note that one soil sample collected prior to excavation did contain 12.9 mg/L Chromium (EP Tox); but Chromium (10.9 mg/kg) is below the 300 mg/kg FRL established for Chromium VI; other metals analyzed (Arsenic, Barium, Cadmium, Mercury, Selenium and Silver) were below establsihed FRLs. 1,1,1-Trichloroethane was detected in the oil-separator (1,050 μg/kg) but was not detected in the soil (no FRL established). *No post-excavation soil samples were collected.* [Sources: USTs-5, -7, -14 and -17 Closeout Report (DOE 1995h); UST-17 Removal Site Evaluation (DOE 1993f)].

TABLE 2-2
(Continued)

TANK ID	DESCRIPTION	FORMER CONTENTS	STATUS & DESCRIPTION OF CLOSURE ACTIVITIES
TANK CLOSED IN PLACE – TO BE REMOVED FROM THE GROUND UNDER CERCLA			
PLANT 6			
UST-14	**Remediation Area:** 4a **Location:** Buried under concrete floor in former scrap melting area (S end) of Plant 6. **Volume:** 3,000 gallons **Size:** 5½ foot diameter x 18 foot length; steel	**Material:** Waste Soluble Machining Oil - a heavy napthenic petroleum oil. **COCs:** Methanol . . . . . (no FRL; no OSDF WAC) **Reference MEFs:** N/A; see MSDS Analysis of tank residues: Methanol, 40 mg/kg; no other volatile or semi-volatile compounds or metals were detected. [Source: UST-14 Closure Report (DOE 1992b)].	**CLOSED IN PLACE – UST to be removed from the ground; Demonstration of Soil FRLs Attainment Needed.** Removed perched water from tank, disconnected process piping and filled tank with grout. To sample the soil beneath the UST, a hole was cut in the bottom of the tank. Perched water began flowing into the tank. *The presence of water precluded the sampling of underlying soils.* [Source: UST-14 Closeout Report (DOE 1995i).] Two soil samples were collected at a total depth of 2 feet below the base of the oil supply line. Results for Lead (17.8 mg/kg) were below the established FRL; BETX constituents (Benzene, Ethylbenzene, Toluene and Xylene) were not detected; TPH was 139-174 mg/kg (no FRL established). [Source: 6/1992 UST-14 Closure Report (DOE 1992b).] An inspector from the State Fire Marshal's office inspected and approved tank abandonment in place on 03/16/1995 [Source: UST-14 Closeout Report (DOE 1995i)].

BETX	Benzene, Ethylbenzene, Toluene and Xylenes
BUSTR	Ohio Bureau of Underground Storage Tank Regulations
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COCs	Constituents of Concern
FRL	Final Remediation Level
HWMU	Hazardous Waste Management Unit
MEF	Material Evaluation Form
mg/kg	milligrams per kilogram
MSDS	Material Safety Data Sheet

VARIANCE / FIELD CHANGE NOTICE

V/FCN 20200-PSP-0002-R0 JR 5-27-99 3-1

WBS NO.: ECDC #20200-PSP-0003 Rev. 0

Page 1 of 1

PROJECT TITLE: Project Specific Plan for Sampling of Stockpiles 1, 2, and 4 for OSDF WAC Attainment

Date: 05/27/99

VARIANCE / FIELD CHANGE NOTICE (Include justification):

CHANGE:
The stockpile PSP requires that samples be collected and head space analysis be performed when the PID reads above-background concentrations. If the head-space analysis is above 10 ppm, the sample is sent to the off-site lab for total VOC analysis. -- 2575

If a series of consecutive intervals that measure above-background on the PID is encountered, the following actions will be taken:

1. Head-space analysis will still be performed in accordance with the PSP.

2. If four or more consecutive 6-inch intervals have head-space analysis results above 10 ppm, the following samples will be sent to the lab:
- the shallowest and deepest samples that exceeded 10 ppm head-space analysis in order to bound the area
- the sample in between the two bounding samples with the highest concentration from the head-space analysis
- if the samples in between the two bounding intervals have the same head-space analysis results, randomly choose an interval or, if there is a change in material types, choose an interval of sandy soil instead of clay soil

3. If biased VOC samples are being collected from a boring and if the designated random sample interval is not above background on the PID scan or does not exceed 10 ppm head-space analysis, the biased sample interval will replace the random interval for TOTAL VOC ANALYSIS ONLY. All other analytes will be collected from the designated random sample interval.

4. If there are both consecutive and non-consecutive intervals that exceed 10 ppm head-space analysis, item #2 above will be implemented for the consecutive intervals and the non-consecutive intervals will be collected in accordance with the current PSP.

JUSTIFICATION:
The goal of this sampling activity is to determine areas of the stockpiles that contain above-WAC concentrations of contaminants. In the case of consecutive intervals of potentially above-WAC VOC concentrations, this goal is still met by collecting only bounding samples and the sample in between with the highest head-space analysis result while at the same time saving time and money by collected less samples.

REQUESTED BY: Christine Messerly DATE: 05/27/99

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE Fred Thompson	5-27-99	X	PROJECT MANAGER	5/27/99
	DATA QUALITY MANAGEMENT			Real-time Program Mgr	
	ANALYTICAL CUSTOMER SUPPORT		X	Characterization Lead C.M.Messerly	5/27/99
X	Sampling Team Manager Mike Franklin	5-27-99	X	WAO Linda Kistler	5/27/99

VARIANCE/FCN APPROVED [X]YES [ ]NO

REVISION REQUIRED: [ ]YES [x]NO

DISTRIBUTION 115

PROJECT MANAGER:	DOCUMENT CONTROL: Jeannie Rosser	OTHER:
QUALITY ASSURANCE:	OTHER:	OTHER:

APPENDIX B

PHYSICAL SAMPLE RESULTS FOR STOCKPILES 1, 2, AND 4

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP1-1-L	0	1.5	5/27/99	1,1-Dichloroethene	10	ug/kg	U	481751	1349728	*11400 ug/kg*
SP1-1-L	0	1.5	5/27/99	Bromodichloromethane	10	ug/kg	U	481751	1349728	*903 ug/kg*
SP1-1-L	0	1.5	5/27/99	Chloroethane	10	ug/kg	U	481751	1349728	*3.92×10^8 ug/kg*
SP1-1-L	0	1.5	5/27/99	cis-1,2-Dichloroethene	10	ug/kg	U	481751	1349728	*11400 ug/kg*
SP1-1-L	0	1.5	5/27/99	Tetrachloroethene	10	ug/kg	U	481751	1349728	*1.28×10^5 ug/kg*
SP1-1-L	0	1.5	5/27/99	trans-1,2-Dichloroethene	10	ug/kg	U	481751	1349728	*11400 ug/kg*
SP1-1-L	0	1.5	5/27/99	Trichloroethene	10	ug/kg	U	481751	1349728	*1.28×10^5 ug/kg*
SP1-1-L	0	1.5	5/27/99	Vinyl chloride	10	ug/kg	U	481751	1349728	*1510 ug/kg*
SP1-1-P	0	1.5	5/27/99	alpha-Chlordane	1.7	ug/kg	U	481751	1349728	*2890 ug/kg*
SP1-1-P	0	1.5	5/27/99	Toxaphene	67	ug/kg	U	481751	1349728	*1.06×10^8 ug/kg*
SP1-1-R	0	1.5	5/27/99	Technetium-99	2.3	pCi/g dry	NV	481751	1349728	*29.1 pCi/g*
SP1-1-R	0	1.5	5/27/99	Uranium, Total	64.4	ug/g dry	NV	481751	1349728	*1030 ug/g*
SP1-1-TL	0	1.5	5/27/99	1,1-Dichloroethene	0.005	mg/L	U	481751	1349728	0.7 mg/L
SP1-1-TL	0	1.5	5/27/99	1,2-Dichloroethane	0.005	mg/L	U	481751	1349728	0.5 mg/L
SP1-1-TL	0	1.5	5/27/99	2-Butanone	0.02	mg/L	U	481751	1349728	200.0 mg/L
SP1-1-TL	0	1.5	5/27/99	Benzene	0.005	mg/L	U	481751	1349728	0.5 mg/L
SP1-1-TL	0	1.5	5/27/99	Carbon Tetrachloride	0.005	mg/L	U	481751	1349728	0.5 mg/L
SP1-1-TL	0	1.5	5/27/99	Chlorobenzene	0.005	mg/L	U	481751	1349728	100.0 mg/L
SP1-1-TL	0	1.5	5/27/99	Chloroform	0.005	mg/L	U	481751	1349728	6.0 mg/L
SP1-1-TL	0	1.5	5/27/99	Tetrachloroethene	0.005	mg/L	U	481751	1349728	0.7 mg/L
SP1-1-TL	0	1.5	5/27/99	Trichloroethene	0.005	mg/L	U	481751	1349728	0.5 mg/L
SP1-1-TL	0	1.5	5/27/99	Vinyl chloride	0.01	mg/L	U	481751	1349728	0.2 mg/L
SP1-1-TM	0	1.5	5/27/99	Arsenic	33.5	ug/L	NV	481751	1349728	5.0 mg/L
SP1-1-TM	0	1.5	5/27/99	Barium	1260	ug/L	NV	481751	1349728	100 mg/L
SP1-1-TM	0	1.5	5/27/99	Cadmium	2.6	ug/L	NV	481751	1349728	1.0 mg/L
SP1-1-TM	0	1.5	5/27/99	Chromium	4	ug/L	NV	481751	1349728	5.0 mg/L
SP1-1-TM	0	1.5	5/27/99	Lead	30.2	ug/L	NV	481751	1349728	5.0 mg/L
SP1-1-TM	0	1.5	5/27/99	Mercury	0.02	ug/L	NV	481751	1349728	0.2 mg/L
SP1-1-TM	0	1.5	5/27/99	Selenium	28	ug/L	NV	481751	1349728	1.0 mg/L
SP1-1-TM	0	1.5	5/27/99	Silver	3.5	ug/L	NV	481751	1349728	5.0 mg/L
SP1-1-TS	0	1.5	5/27/99	1,4-Dichlorobenzene	0.05	mg/L	U	481751	1349728	7.5 mg/L
SP1-1-TS	0	1.5	5/27/99	2,4,5-TP (Silvex)	0.01	mg/L	U	481751	1349728	1.0 mg/L
SP1-1-TS	0	1.5	5/27/99	2,4,5-Trichlorophenol	0.05	mg/L	U	481751	1349728	400 mg/L
SP1-1-TS	0	1.5	5/27/99	2,4,6-Trichlorophenol	0.05	mg/L	U	481751	1349728	2.0 mg/L
SP1-1-TS	0	1.5	5/27/99	2,4-D	0.04	mg/L	U	481751	1349728	10.0 mg/L
SP1-1-TS	0	1.5	5/27/99	2,4-Dinitrotoluene	0.05	mg/L	U	481751	1349728	0.13 mg/L
SP1-1-TS	0	1.5	5/27/99	Chlordane	0.005	mg/L	U	481751	1349728	0.03 mg/L
SP1-1-TS	0	1.5	5/27/99	Endrin	0.0005	mg/L	UJ	481751	1349728	0.02 mg/L
SP1-1-TS	0	1.5	5/27/99	gamma-BHC (Lindane)	0.0005	mg/L	U	481751	1349728	0.4 mg/L
SP1-1-TS	0	1.5	5/27/99	Heptachlor	0.0005	mg/L	U	481751	1349728	0.008 mg/L
SP1-1-TS	0	1.5	5/27/99	Heptachlor epoxide	0.0005	mg/L	U	481751	1349728	0.008 mg/L
SP1-1-TS	0	1.5	5/27/99	Hexachlorobenzene	0.05	mg/L	U	481751	1349728	0.13 mg/L

2575

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP1-1-TS	0	1.5	5/27/99	Hexachlorobutadiene	0.05	mg/L	U	481751	1349728	0.5 mg/L
SP1-1-TS	0	1.5	5/27/99	Hexachloroethane	0.05	mg/L	UJ	481751	1349728	3.0 mg/L
SP1-1-TS	0	1.5	5/27/99	m,p-Methylphenol	0.05	mg/L	U	481751	1349728	200 mg/L
SP1-1-TS	0	1.5	5/27/99	Methoxychlor	0.001	mg/L	U	481751	1349728	10.0 mg/L
SP1-1-TS	0	1.5	5/27/99	Nitrobenzene	0.05	mg/L	U	481751	1349728	2.0 mg/L
SP1-1-TS	0	1.5	5/27/99	o-Methylphenol	0.05	mg/L	U	481751	1349728	200 mg/L
SP1-1-TS	0	1.5	5/27/99	Pentachlorophenol	0.25	mg/L	U	481751	1349728	100.0 mg/L
SP1-1-TS	0	1.5	5/27/99	Pyridine	0.05	mg/L	U	481751	1349728	5.0 mg/L
SP1-1-TS	0	1.5	5/27/99	Toxaphene	0.02	mg/L	U	481751	1349728	0.5 mg/L
SP1-2-L	1	2.5	5/27/99	1,1-Dichloroethene	10	ug/kg	U	481782	1349720	*11400 ug/kg*
SP1-2-L	1	2.5	5/27/99	Bromodichloromethane	10	ug/kg	U	481782	1349720	*903 ug/kg*
SP1-2-L	1	2.5	5/27/99	Chloroethane	10	ug/kg	U	481782	1349720	*3.92×10^8 ug/kg*
SP1-2-L	1	2.5	5/27/99	cis-1,2-Dichloroethene	10	ug/kg	U	481782	1349720	*11400 ug/kg*
SP1-2-L	1	2.5	5/27/99	Tetrachloroethene	10	ug/kg	U	481782	1349720	*1.28×10^5 ug/kg*
SP1-2-L	1	2.5	5/27/99	trans-1,2-Dichloroethene	10	ug/kg	U	481782	1349720	*11400 ug/kg*
SP1-2-L	1	2.5	5/27/99	Trichloroethene	10	ug/kg	U	481782	1349720	*1.28×10^5 ug/kg*
SP1-2-L	1	2.5	5/27/99	Vinyl chloride	10	ug/kg	U	481782	1349720	*1510 ug/kg*
SP1-2-P	1	2.5	5/27/99	alpha-Chlordane	1.7	ug/kg	U	481782	1349720	*2890 ug/kg*
SP1-2-P	1	2.5	5/27/99	Toxaphene	67	ug/kg	U	481782	1349720	*1.06×10^8 ug/kg*
SP1-2-R	1	2.5	5/27/99	Technetium-99	1.3	pCi/g dry	NV	481782	1349720	*29.1 pCi/g*
SP1-2-R	1	2.5	5/27/99	Uranium, Total	63.1	ug/g dry	NV	481782	1349720	*1030 ug/g*
SP1-2-TL	1	2.5	5/27/99	1,1-Dichloroethene	0.005	mg/L	U	481782	1349720	0.7 mg/L
SP1-2-TL	1	2.5	5/27/99	1,2-Dichloroethane	0.005	mg/L	U	481782	1349720	0.5 mg/L
SP1-2-TL	1	2.5	5/27/99	2-Butanone	0.02	mg/L	U	481782	1349720	200.0 mg/L
SP1-2-TL	1	2.5	5/27/99	Benzene	0.005	mg/L	U	481782	1349720	0.5 mg/L
SP1-2-TL	1	2.5	5/27/99	Carbon Tetrachloride	0.005	mg/L	U	481782	1349720	0.5 mg/L
SP1-2-TL	1	2.5	5/27/99	Chlorobenzene	0.005	mg/L	U	481782	1349720	100.0 mg/L
SP1-2-TL	1	2.5	5/27/99	Chloroform	0.005	mg/L	U	481782	1349720	6.0 mg/L
SP1-2-TL	1	2.5	5/27/99	Tetrachloroethene	0.005	mg/L	U	481782	1349720	0.7 mg/L
SP1-2-TL	1	2.5	5/27/99	Trichloroethene	0.005	mg/L	U	481782	1349720	0.5 mg/L
SP1-2-TL	1	2.5	5/27/99	Vinyl chloride	0.01	mg/L	U	481782	1349720	0.2 mg/L
SP1-2-TM	1	2.5	5/27/99	Arsenic	33.5	ug/L	NV	481782	1349720	5.0 mg/L
SP1-2-TM	1	2.5	5/27/99	Barium	1210	ug/L	NV	481782	1349720	100 mg/L
SP1-2-TM	1	2.5	5/27/99	Cadmium	1.5	ug/L	NV	481782	1349720	1.0 mg/L
SP1-2-TM	1	2.5	5/27/99	Chromium	3.9	ug/L	NV	481782	1349720	5.0 mg/L
SP1-2-TM	1	2.5	5/27/99	Lead	27.6	ug/L	NV	481782	1349720	5.0 mg/L
SP1-2-TM	1	2.5	5/27/99	Mercury	0.02	ug/L	NV	481782	1349720	0.2 mg/L
SP1-2-TM	1	2.5	5/27/99	Selenium	28	ug/L	NV	481782	1349720	1.0 mg/L
SP1-2-TM	1	2.5	5/27/99	Silver	3.5	ug/L	NV	481782	1349720	5.0 mg/L
SP1-2-TS	1	2.5	5/27/99	1,4-Dichlorobenzene	0.05	mg/L	U	481782	1349720	7.5 mg/L
SP1-2-TS	1	2.5	5/27/99	2,4,5-TP (Silvex)	0.01	mg/L	U	481782	1349720	1.0 mg/L
SP1-2-TS	1	2.5	5/27/99	2,4,5-Trichlorophenol	0.05	mg/L	U	481782	1349720	400 mg/L

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP1-2-TS	1	2.5	5/27/99	2,4,6-Trichlorophenol	0.05	mg/L	U	481782	1349720	2.0 mg/L
SP1-2-TS	1	2.5	5/27/99	2,4-D	0.04	mg/L	U	481782	1349720	10.0 mg/L
SP1-2-TS	1	2.5	5/27/99	2,4-Dinitrotoluene	0.05	mg/L	U	481782	1349720	0.13 mg/L
SP1-2-TS	1	2.5	5/27/99	Chlordane	0.005	mg/L	U	481782	1349720	0.03 mg/L
SP1-2-TS	1	2.5	5/27/99	Endrin	0.0005	mg/L	UJ	481782	1349720	0.02 mg/L
SP1-2-TS	1	2.5	5/27/99	gamma-BHC (Lindane)	0.0005	mg/L	U	481782	1349720	0.4 mg/L
SP1-2-TS	1	2.5	5/27/99	Heptachlor	0.0005	mg/L	U	481782	1349720	0.008 mg/L
SP1-2-TS	1	2.5	5/27/99	Heptachlor epoxide	0.0005	mg/L	U	481782	1349720	0.008 mg/L
SP1-2-TS	1	2.5	5/27/99	Hexachlorobenzene	0.05	mg/L	U	481782	1349720	0.13 mg/L
SP1-2-TS	1	2.5	5/27/99	Hexachlorobutadiene	0.05	mg/L	U	481782	1349720	0.5 mg/L
SP1-2-TS	1	2.5	5/27/99	Hexachloroethane	0.05	mg/L	UJ	481782	1349720	3.0 mg/L
SP1-2-TS	1	2.5	5/27/99	m,p-Methylphenol	0.05	mg/L	U	481782	1349720	200 mg/L
SP1-2-TS	1	2.5	5/27/99	Methoxychlor	0.001	mg/L	U	481782	1349720	10.0 mg/L
SP1-2-TS	1	2.5	5/27/99	Nitrobenzene	0.05	mg/L	U	481782	1349720	2.0 mg/L
SP1-2-TS	1	2.5	5/27/99	o-Methylphenol	0.05	mg/L	U	481782	1349720	200 mg/L
SP1-2-TS	1	2.5	5/27/99	Pentachlorophenol	0.25	mg/L	U	481782	1349720	100.0 mg/L
SP1-2-TS	1	2.5	5/27/99	Pyridine	0.05	mg/L	U	481782	1349720	5.0 mg/L
SP1-2-TS	1	2.5	5/27/99	Toxaphene	0.02	mg/L	U	481782	1349720	0.5 mg/L
SP1-3-L	0	1.5	5/19/99	1,1-Dichloroethene	10	ug/kg	U	481818	1349736	*11400 ug/kg*
SP1-3-L	0	1.5	5/19/99	Bromodichloromethane	10	ug/kg	U	481818	1349736	*903 ug/kg*
SP1-3-L	0	1.5	5/19/99	Chloroethane	10	ug/kg	U	481818	1349736	*3.92×10^8 ug/kg*
SP1-3-L	0	1.5	5/19/99	cis-1,2-Dichloroethene	10	ug/kg	U	481818	1349736	*11400 ug/kg*
SP1-3-L	0	1.5	5/19/99	Tetrachloroethene	10	ug/kg	UJ	481818	1349736	*1.28×10^5 ug/kg*
SP1-3-L	0	1.5	5/19/99	trans-1,2-Dichloroethene	10	ug/kg	U	481818	1349736	*11400 ug/kg*
SP1-3-L	0	1.5	5/19/99	Trichloroethene	10	ug/kg	U	481818	1349736	*1.28×10^5 ug/kg*
SP1-3-L	0	1.5	5/19/99	Vinyl chloride	10	ug/kg	UJ	481818	1349736	*1510 ug/kg*
SP1-3-P	0	1.5	5/19/99	alpha-Chlordane	1.7	ug/kg	U	481818	1349736	*2890 ug/kg*
SP1-3-P	0	1.5	5/19/99	Toxaphene	67	ug/kg	U	481818	1349736	*1.06×10^8 ug/kg*
SP1-3-R	0	1.5	5/19/99	Technetium-99	2.3	pCi/g dry	NV	481818	1349736	*29.1 pCi/g*
SP1-3-R	0	1.5	5/19/99	Uranium, Total	36.3	ug/g dry	NV	481818	1349736	*1030 ug/g*
SP1-3-TL	0	1.5	5/19/99	1,1-Dichloroethene	0.005	mg/L	U	481818	1349736	0.7 mg/L
SP1-3-TL	0	1.5	5/19/99	1,2-Dichloroethane	0.005	mg/L	U	481818	1349736	0.5 mg/L
SP1-3-TL	0	1.5	5/19/99	2-Butanone	0.02	mg/L	U	481818	1349736	200.0 mg/L
SP1-3-TL	0	1.5	5/19/99	Benzene	0.005	mg/L	U	481818	1349736	0.5 mg/L
SP1-3-TL	0	1.5	5/19/99	Carbon Tetrachloride	0.005	mg/L	U	481818	1349736	0.5 mg/L
SP1-3-TL	0	1.5	5/19/99	Chlorobenzene	0.005	mg/L	U	481818	1349736	100.0 mg/L
SP1-3-TL	0	1.5	5/19/99	Chloroform	0.005	mg/L	U	481818	1349736	6.0 mg/L
SP1-3-TL	0	1.5	5/19/99	Tetrachloroethene	0.005	mg/L	UJ	481818	1349736	0.7 mg/L
SP1-3-TL	0	1.5	5/19/99	Trichloroethene	0.005	mg/L	U	481818	1349736	0.5 mg/L
SP1-3-TL	0	1.5	5/19/99	Vinyl chloride	0.01	mg/L	UJ	481818	1349736	0.2 mg/L
SP1-3-TM	0	1.5	5/19/99	Arsenic	33.5	ug/L	NV	481818	1349736	5.0 mg/L
SP1-3-TM	0	1.5	5/19/99	Barium	1060	ug/L	NV	481818	1349736	100 mg/L

120

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP1-3-TM	0	1.5	5/19/99	Cadmium	2.8	ug/L	NV	481818	1349736	1.0 mg/L
SP1-3-TM	0	1.5	5/19/99	Chromium	3.7	ug/L	NV	481818	1349736	5.0 mg/L
SP1-3-TM	0	1.5	5/19/99	Lead	40.6	ug/L	NV	481818	1349736	5.0 mg/L
SP1-3-TM	0	1.5	5/19/99	Mercury	0.02	ug/L	NV	481818	1349736	0.2 mg/L
SP1-3-TM	0	1.5	5/19/99	Selenium	28	ug/L	NV	481818	1349736	1.0 mg/L
SP1-3-TM	0	1.5	5/19/99	Silver	5.8	ug/L	NV	481818	1349736	5.0 mg/L
SP1-3-TM	0	1.5	5/19/99	1,4-Dichlorobenzene	0.05	mg/L	U	481818	1349736	7.5 mg/L
SP1-3-TS	0	1.5	5/19/99	2,4,5-TP (Silvex)	0.01	mg/L	U	481818	1349736	1.0 mg/L
SP1-3-TS	0	1.5	5/19/99	2,4,5-Trichlorophenol	0.05	mg/L	U	481818	1349736	400 mg/L
SP1-3-TS	0	1.5	5/19/99	2,4,6-Trichlorophenol	0.05	mg/L	U	481818	1349736	2.0 mg/L
SP1-3-TS	0	1.5	5/19/99	2,4-D	0.04	mg/L	U	481818	1349736	10.0 mg/L
SP1-3-TS	0	1.5	5/19/99	2,4-Dinitrotoluene	0.05	mg/L	U	481818	1349736	0.13 mg/L
SP1-3-TS	0	1.5	5/19/99	Chlordane	0.005	mg/L	U	481818	1349736	0.03 mg/L
SP1-3-TS	0	1.5	5/19/99	Endrin	0.0005	mg/L	U	481818	1349736	0.02 mg/L
SP1-3-TS	0	1.5	5/19/99	gamma-BHC (Lindane)	0.0005	mg/L	U	481818	1349736	0.4 mg/L
SP1-3-TS	0	1.5	5/19/99	Heptachlor	0.0005	mg/L	U	481818	1349736	0.008 mg/L
SP1-3-TS	0	1.5	5/19/99	Heptachlor epoxide	0.0005	mg/L	U	481818	1349736	0.008 mg/L
SP1-3-TS	0	1.5	5/19/99	Hexachlorobenzene	0.05	mg/L	U	481818	1349736	0.13 mg/L
SP1-3-TS	0	1.5	5/19/99	Hexachlorobutadiene	0.05	mg/L	U	481818	1349736	0.5 mg/L
SP1-3-TS	0	1.5	5/19/99	Hexachloroethane	0.05	mg/L	U	481818	1349736	3.0 mg/L
SP1-3-TS	0	1.5	5/19/99	m,p-Methylphenol	0.02	mg/L	U	481818	1349736	200 mg/L
SP1-3-TS	0	1.5	5/19/99	Methoxychlor	0.001	mg/L	UJ	481818	1349736	10.0 mg/L
SP1-3-TS	0	1.5	5/19/99	Nitrobenzene	0.05	mg/L	U	481818	1349736	2.0 mg/L
SP1-3-TS	0	1.5	5/19/99	o-Methylphenol	0.05	mg/L	U	481818	1349736	200 mg/L
SP1-3-TS	0	1.5	5/19/99	Pentachlorophenol	0.25	mg/L	U	481818	1349736	100.0 mg/L
SP1-3-TS	0	1.5	5/19/99	Pyridine	0.05	mg/L	U	481818	1349736	5.0 mg/L
SP1-3-TS	0	1.5	5/19/99	Toxaphene	0.02	mg/L	U	481818	1349736	0.5 mg/L
SP1-4-L	0	1.5	5/27/99	1,1-Dichloroethene	10	ug/kg	U	481851	1349715	*11400 ug/kg*
SP1-4-L	0	1.5	5/27/99	Bromodichloromethane	10	ug/kg	U	481851	1349715	*903 ug/kg*
SP1-4-L	0	1.5	5/27/99	Chloroethane	10	ug/kg	U	481851	1349715	*3.92×10^8 ug/kg*
SP1-4-L	0	1.5	5/27/99	cis-1,2-Dichloroethene	10	ug/kg	U	481851	1349715	*11400 ug/kg*
SP1-4-L	0	1.5	5/27/99	Tetrachloroethene	10	ug/kg	U	481851	1349715	*1.28×10^5 ug/kg*
SP1-4-L	0	1.5	5/27/99	trans-1,2-Dichloroethene	10	ug/kg	U	481851	1349715	*11400 ug/kg*
SP1-4-L	0	1.5	5/27/99	Trichloroethene	10	ug/kg	U	481851	1349715	*1.28×10^5 ug/kg*
SP1-4-L	0	1.5	5/27/99	Vinyl chloride	10	ug/kg	U	481851	1349715	*1510 ug/kg*
SP1-4-P	0	1.5	5/27/99	alpha-Chlordane	1.7	ug/kg	U	481851	1349715	*2890 ug/kg*
SP1-4-P	0	1.5	5/27/99	Toxaphene	67	ug/kg	U	481851	1349715	*1.06×10^8 ug/kg*
SP1-4-R	0	1.5	5/27/99	Technetium-99	0.69	pCi/g dry	NV	481851	1349715	*29.1 pCi/g*
SP1-4-R	0	1.5	5/27/99	Uranium, Total	1.96	ug/g dry	NV	481851	1349715	*1030 ug/g*
SP1-4-TL	0	1.5	5/27/99	1,1-Dichloroethene	0.005	mg/L	U	481851	1349715	0.7 mg/L
SP1-4-TL	0	1.5	5/27/99	1,2-Dichloroethane	0.005	mg/L	U	481851	1349715	0.5 mg/L
SP1-4-TL	0	1.5	5/27/99	2-Butanone	0.02	mg/L	U	481851	1349715	200.0 mg/L

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP1-4-TL	0	1.5	5/27/99	Benzene	0.005	mg/L	U	481851	1349715	0.5 mg/L
SP1-4-TL	0	1.5	5/27/99	Carbon Tetrachloride	0.005	mg/L	U	481851	1349715	0.5 mg/L
SP1-4-TL	0	1.5	5/27/99	Chlorobenzene	0.005	mg/L	U	481851	1349715	100.0 mg/L
SP1-4-TL	0	1.5	5/27/99	Chloroform	0.005	mg/L	U	481851	1349715	6.0 mg/L
SP1-4-TL	0	1.5	5/27/99	Tetrachloroethene	0.005	mg/L	U	481851	1349715	0.7 mg/L
SP1-4-TL	0	1.5	5/27/99	Trichloroethene	0.005	mg/L	U	481851	1349715	0.5 mg/L
SP1-4-TL	0	1.5	5/27/99	Vinyl chloride	0.01	mg/L	U	481851	1349715	0.2 mg/L
SP1-4-TM	0	1.5	5/27/99	Arsenic	33.5	ug/L	NV	481851	1349715	5.0 mg/L
SP1-4-TM	0	1.5	5/27/99	Barium	912	ug/L	NV	481851	1349715	100 mg/L
SP1-4-TM	0	1.5	5/27/99	Cadmium	1.5	ug/L	NV	481851	1349715	1.0 mg/L
SP1-4-TM	0	1.5	5/27/99	Chromium	6.7	ug/L	NV	481851	1349715	5.0 mg/L
SP1-4-TM	0	1.5	5/27/99	Lead	27.6	ug/L	NV	481851	1349715	5.0 mg/L
SP1-4-TM	0	1.5	5/27/99	Mercury	0.02	ug/L	NV	481851	1349715	0.2 mg/L
SP1-4-TM	0	1.5	5/27/99	Selenium	28	ug/L	NV	481851	1349715	1.0 mg/L
SP1-4-TM	0	1.5	5/27/99	Silver	3.5	ug/L	NV	481851	1349715	5.0 mg/L
SP1-4-TS	0	1.5	5/27/99	1,4-Dichlorobenzene	0.05	mg/L	U	481851	1349715	7.5 mg/L
SP1-4-TS	0	1.5	5/27/99	2,4,5-TP (Silvex)	0.01	mg/L	U	481851	1349715	1.0 mg/L
SP1-4-TS	0	1.5	5/27/99	2,4,5-Trichlorophenol	0.05	mg/L	U	481851	1349715	400 mg/L
SP1-4-TS	0	1.5	5/27/99	2,4,6-Trichlorophenol	0.05	mg/L	U	481851	1349715	2.0 mg/L
SP1-4-TS	0	1.5	5/27/99	2,4-D	0.04	mg/L	U	481851	1349715	10.0 mg/L
SP1-4-TS	0	1.5	5/27/99	2,4-Dinitrotoluene	0.05	mg/L	U	481851	1349715	0.13 mg/L
SP1-4-TS	0	1.5	5/27/99	Chlordane	0.005	mg/L	U	481851	1349715	0.03 mg/L
SP1-4-TS	0	1.5	5/27/99	Endrin	0.0005	mg/L	UJ	481851	1349715	0.02 mg/L
SP1-4-TS	0	1.5	5/27/99	gamma-BHC (Lindane)	0.0005	mg/L	U	481851	1349715	0.4 mg/L
SP1-4-TS	0	1.5	5/27/99	Heptachlor	0.0005	mg/L	U	481851	1349715	0.008 mg/L
SP1-4-TS	0	1.5	5/27/99	Heptachlor epoxide	0.0005	mg/L	U	481851	1349715	0.008 mg/L
SP1-4-TS	0	1.5	5/27/99	Hexachlorobenzene	0.05	mg/L	U	481851	1349715	0.13 mg/L
SP1-4-TS	0	1.5	5/27/99	Hexachlorobutadiene	0.05	mg/L	U	481851	1349715	0.5 mg/L
SP1-4-TS	0	1.5	5/27/99	Hexachloroethane	0.05	mg/L	UJ	481851	1349715	3.0 mg/L
SP1-4-TS	0	1.5	5/27/99	m,p-Methylphenol	0.05	mg/L	U	481851	1349715	200 mg/L
SP1-4-TS	0	1.5	5/27/99	Methoxychlor	0.001	mg/L	U	481851	1349715	10.0 mg/L
SP1-4-TS	0	1.5	5/27/99	Nitrobenzene	0.05	mg/L	U	481851	1349715	2.0 mg/L
SP1-4-TS	0	1.5	5/27/99	o-Methylphenol	0.05	mg/L	U	481851	1349715	200 mg/L
SP1-4-TS	0	1.5	5/27/99	Pentachlorophenol	0.25	mg/L	U	481851	1349715	100.0 mg/L
SP1-4-TS	0	1.5	5/27/99	Pyridine	0.05	mg/L	U	481851	1349715	5.0 mg/L
SP1-4-TS	0	1.5	5/27/99	Toxaphene	0.02	mg/L	U	481851	1349715	0.5 mg/L
SP1-5-R	0	1.5	5/27/99	Technetium-99	0.34	pCi/g dry	NV	481872	1349720	*29.1 pCi/g*
SP1-5-R	0	1.5	5/27/99	Uranium, Total	1.83	ug/g dry	NV	481872	1349720	*1030 ug/g*
SP1-5-S	0	1.5	5/27/99	4-Nitroaniline	820	ug/kg	U	481872	1349720	*44.2 ug/kg*
SP1-5-S	0	1.5	5/27/99	bis(2-Chloroisopropyl) ether	330	ug/kg	U	481872	1349720	*24.4 ug/kg*
SP1-5-S	0	1.5	5/27/99	Carbazole	330	ug/kg	U	481872	1349720	*7.27×10^7 ug/kg*
SP1-6-R	0	1	5/19/99	Technetium-99	1.7	pCi/g dry	NV	481747	1349768	*29.1 pCi/g*
SP1-6-R	0	1	5/19/99	Uranium, Total	35.8	ug/g dry	NV	481747	1349768	*1030 ug/g*

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP1-7-R	4	5.5	5/19/99	Technetium-99	2.8	pCi/g dry	NV	481779	1349749	*29.1 pCi/g*
SP1-7-R	4	5.5	5/19/99	Uranium, Total	102	ug/g dry	NV	481779	1349749	*1030 ug/g*
SP1-8-R	0	0.6	5/19/99	Technetium-99	0.14	pCi/g dry	NV	481819	1349788	*29.1 pCi/g*
SP1-8-R	0	0.6	5/19/99	Uranium, Total	21.4	ug/g dry	NV	481819	1349788	*1030 ug/g*
SP1-9-L	0	0.7	5/19/99	1,1-Dichloroethene	10	ug/kg	U	481843	1349765	*11400 ug/kg*
SP1-9-L	0	0.7	5/19/99	Bromodichloromethane	10	ug/kg	U	481843	1349765	*903 ug/kg*
SP1-9-L	0	0.7	5/19/99	Chloroethane	10	ug/kg	U	481843	1349765	*3.92×10^8 ug/kg*
SP1-9-L	0	0.7	5/19/99	cis-1,2-Dichloroethene	10	ug/kg	U	481843	1349765	*11400 ug/kg*
SP1-9-L	0	0.7	5/19/99	Tetrachloroethene	10	ug/kg	UJ	481843	1349765	*1.28×10^5 ug/kg*
SP1-9-L	0	0.7	5/19/99	trans-1,2-Dichloroethene	10	ug/kg	U	481843	1349765	*11400 ug/kg*
SP1-9-L	0	0.7	5/19/99	Trichloroethene	10	ug/kg	U	481843	1349765	*1.28×10^5 ug/kg*
SP1-9-L	0	0.7	5/19/99	Vinyl chloride	10	ug/kg	UJ	481843	1349765	*1510 ug/kg*
SP1-9-P	0	0.7	5/19/99	alpha-Chlordane	1.7	ug/kg	U	481843	1349765	*2890 ug/kg*
SP1-9-P	0	0.7	5/19/99	Toxaphene	67	ug/kg	U	481843	1349765	*1.06×10^8 ug/kg*
SP1-9-R	0	0.7	5/19/99	Technetium-99	0.46	pCi/g dry	NV	481843	1349765	*29.1 pCi/g*
SP1-9-R	0	0.7	5/19/99	Uranium, Total	23.3	ug/g dry	NV	481843	1349765	*1030 ug/g*
SP1-9-TL	0	0.7	5/19/99	1,1-Dichloroethene	0.005	mg/L	U	481843	1349765	0.7 mg/L
SP1-9-TL	0	0.7	5/19/99	1,2-Dichloroethane	0.005	mg/L	U	481843	1349765	0.5 mg/L
SP1-9-TL	0	0.7	5/19/99	2-Butanone	0.02	mg/L	U	481843	1349765	200.0 mg/L
SP1-9-TL	0	0.7	5/19/99	Benzene	0.005	mg/L	U	481843	1349765	0.5 mg/L
SP1-9-TL	0	0.7	5/19/99	Carbon Tetrachloride	0.005	mg/L	U	481843	1349765	0.5 mg/L
SP1-9-TL	0	0.7	5/19/99	Chlorobenzene	0.005	mg/L	U	481843	1349765	100.0 mg/L
SP1-9-TL	0	0.7	5/19/99	Chloroform	0.005	mg/L	U	481843	1349765	6.0 mg/L
SP1-9-TL	0	0.7	5/19/99	Tetrachloroethene	0.005	mg/L	UJ	481843	1349765	0.7 mg/L
SP1-9-TL	0	0.7	5/19/99	Trichloroethene	0.005	mg/L	U	481843	1349765	0.5 mg/L
SP1-9-TL	0	0.7	5/19/99	Vinyl chloride	0.01	mg/L	UJ	481843	1349765	0.2 mg/L
SP1-9-TM	0	0.7	5/19/99	Arsenic	33.5	ug/L	NV	481843	1349765	5.0 mg/L
SP1-9-TM	0	0.7	5/19/99	Barium	961	ug/L	NV	481843	1349765	100 mg/L
SP1-9-TM	0	0.7	5/19/99	Cadmium	1.5	ug/L	NV	481843	1349765	1.0 mg/L
SP1-9-TM	0	0.7	5/19/99	Chromium	4.3	ug/L	NV	481843	1349765	5.0 mg/L
SP1-9-TM	0	0.7	5/19/99	Lead	27.6	ug/L	NV	481843	1349765	5.0 mg/L
SP1-9-TM	0	0.7	5/19/99	Mercury	0.02	ug/L	NV	481843	1349765	0.2 mg/L
SP1-9-TM	0	0.7	5/19/99	Selenium	28	ug/L	NV	481843	1349765	1.0 mg/L
SP1-9-TM	0	0.7	5/19/99	Silver	4.3	ug/L	NV	481843	1349765	5.0 mg/L
SP1-9-TS	0	0.7	5/19/99	1,4-Dichlorobenzene	0.05	mg/L	U	481843	1349765	7.5 mg/L
SP1-9-TS	0	0.7	5/19/99	2,4,5-TP (Silvex)	0.01	mg/L	U	481843	1349765	1.0 mg/L
SP1-9-TS	0	0.7	5/19/99	2,4,5-Trichlorophenol	0.05	mg/L	U	481843	1349765	400 mg/L
SP1-9-TS	0	0.7	5/19/99	2,4,6-Trichlorophenol	0.05	mg/L	U	481843	1349765	2.0 mg/L
SP1-9-TS	0	0.7	5/19/99	2,4-D	0.04	mg/L	U	481843	1349765	10.0 mg/L
SP1-9-TS	0	0.7	5/19/99	2,4-Dinitrotoluene	0.05	mg/L	U	481843	1349765	0.13 mg/L
SP1-9-TS	0	0.7	5/19/99	Chlordane	0.005	mg/L	U	481843	1349765	0.03 mg/L
SP1-9-TS	0	0.7	5/19/99	Endrin	0.0005	mg/L	U	481843	1349765	0.02 mg/L

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP1-9-TS	0	0.7	5/19/99	gamma-BHC (Lindane)	0.0005	mg/L	U	481843	1349765	0.4 mg/L
SP1-9-TS	0	0.7	5/19/99	Heptachlor	0.0005	mg/L	U	481843	1349765	0.008 mg/L
SP1-9-TS	0	0.7	5/19/99	Heptachlor epoxide	0.0005	mg/L	U	481843	1349765	0.008 mg/L
SP1-9-TS	0	0.7	5/19/99	Hexachlorobenzene	0.05	mg/L	U	481843	1349765	0.13 mg/L
SP1-9-TS	0	0.7	5/19/99	Hexachlorobutadiene	0.05	mg/L	U	481843	1349765	0.5 mg/L
SP1-9-TS	0	0.7	5/19/99	Hexachloroethane	0.05	mg/L	U	481843	1349765	3.0 mg/L
SP1-9-TS	0	0.7	5/19/99	m,p-Methylphenol	0.05	mg/L	U	481843	1349765	200 mg/L
SP1-9-TS	0	0.7	5/19/99	Methoxychlor	0.001	mg/L	UJ	481843	1349765	10.0 mg/L
SP1-9-TS	0	0.7	5/19/99	Nitrobenzene	0.05	mg/L	U	481843	1349765	2.0 mg/L
SP1-9-TS	0	0.7	5/19/99	o-Methylphenol	0.05	mg/L	U	481843	1349765	200 mg/L
SP1-9-TS	0	0.7	5/19/99	Pentachlorophenol	0.25	mg/L	U	481843	1349765	100.0 mg/L
SP1-9-TS	0	0.7	5/19/99	Pyridine	0.05	mg/L	U	481843	1349765	5.0 mg/L
SP1-9-TS	0	0.7	5/19/99	Toxaphene	0.02	mg/L	U	481843	1349765	0.5 mg/L
SP1-10-R	0	1.5	5/19/99	Technetium-99	1.8	pCi/g dry	NV	481862	1349750	*29.1 pCi/g*
SP1-10-R	0	1.5	5/19/99	Uranium, Total	36.2	ug/g dry	NV	481862	1349750	*1030 ug/g*
SP2-1-R	0	1.5	5/12/99	Technetium-99	0.32	pCi/g dry	NV	482134	1348617	*29.1 pCi/g*
SP2-1-R	0	1.5	5/12/99	Uranium, Total	36.8	ug/g dry	NV	482134	1348617	*1030 ug/g*
SP2-1-S	0	1.5	5/12/99	4-Nitroaniline	820	ug/kg	U	482134	1348617	*44.2 ug/kg*
SP2-1-S	0	1.5	5/12/99	bis(2-Chloroisopropyl) ether	330	ug/kg	U	482134	1348617	*24.4 ug/kg*
SP2-1-S	0	1.5	5/12/99	Carbazole	43	ug/kg	J	482134	1348617	*7.27×10^7 ug/kg*
SP2-2-R	4	5.5	5/13/99	Technetium-99	0.78	pCi/g dry	NV	482147	1348650	*29.1 pCi/g*
SP2-2-R	4	5.5	5/13/99	Uranium, Total	105	ug/g dry	NV	482147	1348650	*1030 ug/g*
SP2-3-R	7	8.5	5/12/99	Technetium-99	0.43	pCi/g dry	NV	482148	1348676	*29.1 pCi/g*
SP2-3-R	7	8.5	5/12/99	Uranium, Total	53.2	ug/g dry	NV	482148	1348676	*1030 ug/g*
SP2-4-R	0	1.5	5/12/99	Technetium-99	0.86	pCi/g dry	NV	482158	1348734	*29.1 pCi/g*
SP2-4-R	0	1.5	5/12/99	Uranium, Total	39.3	ug/g dry	NV	482158	1348734	*1030 ug/g*
SP2-5-R	8	9.2	5/13/99	Technetium-99	-0.039	pCi/g dry	NV	482166	1348652	*29.1 pCi/g*
SP2-5-R	8	9.2	5/13/99	Uranium, Total	43.6	ug/g dry	NV	482166	1348652	*1030 ug/g*
SP2-6-R	7	8.5	5/13/99	Technetium-99	0.84	pCi/g dry	NV	482175	1348695	*29.1 pCi/g*
SP2-6-R	7	8.5	5/13/99	Uranium, Total	43.5	ug/g dry	NV	482175	1348695	*1030 ug/g*
SP2-7-R	5	6.4	5/13/99	Technetium-99	0.67	pCi/g dry	NV	482175	1348725	*29.1 pCi/g*
SP2-7-R	5	6.4	5/13/99	Uranium, Total	31.2	ug/g dry	NV	482175	1348725	*1030 ug/g*
SP2-8-R	3	4.5	5/13/99	Technetium-99	0.053	pCi/g dry	NV	482196	1348651	*29.1 pCi/g*
SP2-8-R	3	4.5	5/13/99	Uranium, Total	30.7	ug/g dry	NV	482196	1348651	*1030 ug/g*
SP2-9-R	3	4.5	5/13/99	Technetium-99	0.75	pCi/g dry	NV	482196	1348677	*29.1 pCi/g*
SP2-9-R	3	4.5	5/13/99	Uranium, Total	60.5	ug/g dry	NV	482196	1348677	*1030 ug/g*
SP2-10-R	0	1.5	5/13/99	Technetium-99	0.5	pCi/g dry	NV	482206	1348725	*29.1 pCi/g*
SP2-10-R	0	1.5	5/13/99	Uranium, Total	52.3	ug/g dry	NV	482206	1348725	*1030 ug/g*
SP4-1-B1-L	1	1.5	5/12/99	1,1-Dichloroethene	10	ug/kg	U	481774	1349368	*11400 ug/kg*
SP4-1-B1-L	1	1.5	5/12/99	Bromodichloromethane	10	ug/kg	U	481774	1349368	*903 ug/kg*
SP4-1-B1-L	1	1.5	5/12/99	Chloroethane	10	ug/kg	U	481774	1349368	*3.92×10^8 ug/kg*
SP4-1-B1-L	1	1.5	5/12/99	cis-1,2-Dichloroethene	10	ug/kg	U	481774	1349368	*11400 ug/kg*
SP4-1-B1-L	1	1.5	5/12/99	Tetrachloroethene	10	ug/kg	U	481774	1349368	*1.28×10^5 ug/kg*

123

I-2575

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP4-1-B1-L	1	1.5	5/12/99	trans-1,2-Dichloroethene	10	ug/kg	U	481774	1349368	*11400 ug/kg*
SP4-1-B1-L	1	1.5	5/12/99	Trichloroethene	10	ug/kg	U	481774	1349368	*1.28 x 10^5 ug/kg*
SP4-1-B1-L	1	1.5	5/12/99	Vinyl chloride	10	ug/kg	UJ	481774	1349368	*1510 ug/kg*
SP4-1-P	1.6	3.1	5/12/99	alpha-Chlordane	1.7	ug/kg	U	481774	1349368	*2890 ug/kg*
SP4-1-P	1.6	3.1	5/12/99	Toxaphene	67	ug/kg	U	481774	1349368	*1.06 x 10^8 ug/kg*
SP4-1-R	1.6	3.1	5/12/99	Technetium-99	0.91	pCi/g dry	U	481774	1349368	*29.1 pCi/g*
SP4-1-R	1.6	3.1	5/12/99	Uranium, Total	13.6	ug/g dry	NV	481774	1349368	*1030 ug/g*
SP4-1-TL	1.6	3.1	5/12/99	1,1-Dichloroethene	0.005	mg/L	U	481774	1349368	0.7 mg/L
SP4-1-TL	1.6	3.1	5/12/99	1,2-Dichloroethane	0.005	mg/L	U	481774	1349368	0.5 mg/L
SP4-1-TL	1.6	3.1	5/12/99	2-Butanone	0.02	mg/L	UJ	481774	1349368	200.0 mg/L
SP4-1-TL	1.6	3.1	5/12/99	Benzene	0.005	mg/L	U	481774	1349368	0.5 mg/L
SP4-1-TL	1.6	3.1	5/12/99	Carbon Tetrachloride	0.005	mg/L	U	481774	1349368	0.5 mg/L
SP4-1-TL	1.6	3.1	5/12/99	Chlorobenzene	0.005	mg/L	U	481774	1349368	100.0 mg/L
SP4-1-TL	1.6	3.1	5/12/99	Chloroform	0.005	mg/L	U	481774	1349368	6.0 mg/L
SP4-1-TL	1.6	3.1	5/12/99	Tetrachloroethene	0.005	mg/L	U	481774	1349368	0.7 mg/L
SP4-1-TL	1.6	3.1	5/12/99	Trichloroethene	0.005	mg/L	U	481774	1349368	0.5 mg/L
SP4-1-TL	1.6	3.1	5/12/99	Vinyl chloride	0.01	mg/L	UJ	481774	1349368	0.2 mg/L
SP4-1-TM	1.6	3.1	5/12/99	Arsenic	33.5	ug/L	NV	481774	1349368	5.0 mg/L
SP4-1-TM	1.6	3.1	5/12/99	Barium	3560	ug/L	NV	481774	1349368	100 mg/L
SP4-1-TM	1.6	3.1	5/12/99	Cadmium	4.6	ug/L	NV	481774	1349368	1.0 mg/L
SP4-1-TM	1.6	3.1	5/12/99	Chromium	5.7	ug/L	NV	481774	1349368	5.0 mg/L
SP4-1-TM	1.6	3.1	5/12/99	Lead	27.6	ug/L	NV	481774	1349368	5.0 mg/L
SP4-1-TM	1.6	3.1	5/12/99	Mercury	0.02	ug/L	NV	481774	1349368	0.2 mg/L
SP4-1-TM	1.6	3.1	5/12/99	Selenium	28	ug/L	NV	481774	1349368	1.0 mg/L
SP4-1-TM	1.6	3.1	5/12/99	Silver	5.7	ug/L	NV	481774	1349368	5.0 mg/L
SP4-1-TS	1.6	3.1	5/12/99	1,4-Dichlorobenzene	0.05	mg/L	U	481774	1349368	7.5 mg/L
SP4-1-TS	1.6	3.1	5/12/99	2,4,5-TP (Silvex)	0.01	mg/L	U	481774	1349368	1.0 mg/L
SP4-1-TS	1.6	3.1	5/12/99	2,4,5-Trichlorophenol	0.05	mg/L	U	481774	1349368	400 mg/L
SP4-1-TS	1.6	3.1	5/12/99	2,4,6-Trichlorophenol	0.05	mg/L	U	481774	1349368	2.0 mg/L
SP4-1-TS	1.6	3.1	5/12/99	2,4-D	0.04	mg/L	U	481774	1349368	10.0 mg/L
SP4-1-TS	1.6	3.1	5/12/99	2,4-Dinitrotoluene	0.05	mg/L	U	481774	1349368	0.13 mg/L
SP4-1-TS	1.6	3.1	5/12/99	Chlordane	0.0025	mg/L	U	481774	1349368	0.03 mg/L
SP4-1-TS	1.6	3.1	5/12/99	Endrin	0.00025	mg/L	U	481774	1349368	0.02 mg/L
SP4-1-TS	1.6	3.1	5/12/99	gamma-BHC (Lindane)	0.00025	mg/L	U	481774	1349368	0.4 mg/L
SP4-1-TS	1.6	3.1	5/12/99	Heptachlor	0.00025	mg/L	U	481774	1349368	0.008 mg/L
SP4-1-TS	1.6	3.1	5/12/99	Heptachlor epoxide	0.00025	mg/L	U	481774	1349368	0.008 mg/L
SP4-1-TS	1.6	3.1	5/12/99	Hexachlorobenzene	0.05	mg/L	U	481774	1349368	0.13 mg/L
SP4-1-TS	1.6	3.1	5/12/99	Hexachlorobutadiene	0.05	mg/L	U	481774	1349368	0.5 mg/L
SP4-1-TS	1.6	3.1	5/12/99	Hexachloroethane	0.05	mg/L	U	481774	1349368	3.0 mg/L
SP4-1-TS	1.6	3.1	5/12/99	m,p-Methylphenol	0.05	mg/L	U	481774	1349368	200 mg/L
SP4-1-TS	1.6	3.1	5/12/99	Methoxychlor	0.0005	mg/L	UJ	481774	1349368	10.0 mg/L
SP4-1-TS	1.6	3.1	5/12/99	Nitrobenzene	0.05	mg/L	U	481774	1349368	2.0 mg/L
SP4-1-TS	1.6	3.1	5/12/99	o-Methylphenol	0.05	mg/L	U	481774	1349368	200 mg/L

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP4-1-TS	1.6	3.1	5/12/99	Pentachlorophenol	0.25	mg/L	U	481774	1349368	100.0 mg/L
SP4-1-TS	1.6	3.1	5/12/99	Pyridine	0.05	mg/L	U	481774	1349368	5.0 mg/L
SP4-1-TS	1.6	3.1	5/12/99	Toxaphene	0.01	mg/L	U	481774	1349368	0.5 mg/L
SP4-2-R	6	7.5	5/12/99	Technetium-99	0.26	pCi/g dry	U	481781	1349400	*29.1 pCi/g*
SP4-2-R	6	7.5	5/12/99	Uranium, Total	9.8	ug/g dry	NV	481781	1349400	*1030 ug/g*
SP4-3-L	0	0.7	5/11/99	1,1-Dichloroethene	10	ug/kg	U	481782	1349472	*11400 ug/kg*
SP4-3-L	0	0.7	5/11/99	Bromodichloromethane	10	ug/kg	UJ	481782	1349472	*903 ug/kg*
SP4-3-L	0	0.7	5/11/99	Chloroethane	10	ug/kg	UJ	481782	1349472	*3.92×10^8 ug/kg*
SP4-3-L	0	0.7	5/11/99	cis-1,2-Dichloroethene	10	ug/kg	U	481782	1349472	*11400 ug/kg*
SP4-3-L	0	0.7	5/11/99	Tetrachloroethene	10	ug/kg	U	481782	1349472	*1.28×10^5 ug/kg*
SP4-3-L	0	0.7	5/11/99	trans-1,2-Dichloroethene	10	ug/kg	U	481782	1349472	*11400 ug/kg*
SP4-3-L	0	0.7	5/11/99	Trichloroethene	10	ug/kg	U	481782	1349472	*1.28×10^5 ug/kg*
SP4-3-L	0	0.7	5/11/99	Vinyl chloride	10	ug/kg	UJ	481782	1349472	*1510 ug/kg*
SP4-3-P	0	0.7	5/11/99	alpha-Chlordane	1.7	ug/kg	U	481782	1349472	*2890 ug/kg*
SP4-3-P	0	0.7	5/11/99	Toxaphene	67	ug/kg	U	481782	1349472	*1.06×10^8 ug/kg*
SP4-3-R	0	0.7	5/11/99	Technetium-99	1.3	pCi/g dry	J	481782	1349472	*29.1 pCi/g*
SP4-3-R	0	0.7	5/11/99	Uranium, Total	18.4	ug/g dry	NV	481782	1349472	*1030 ug/g*
SP4-3-TL	0	0.7	5/11/99	1,1-Dichloroethene	0.005	mg/L	U	481782	1349472	0.7 mg/L
SP4-3-TL	0	0.7	5/11/99	1,2-Dichloroethane	0.005	mg/L	U	481782	1349472	0.5 mg/L
SP4-3-TL	0	0.7	5/11/99	2-Butanone	0.02	mg/L	UJ	481782	1349472	200.0 mg/L
SP4-3-TL	0	0.7	5/11/99	Benzene	0.005	mg/L	U	481782	1349472	0.5 mg/L
SP4-3-TL	0	0.7	5/11/99	Carbon Tetrachloride	0.005	mg/L	U	481782	1349472	0.5 mg/L
SP4-3-TL	0	0.7	5/11/99	Chlorobenzene	0.005	mg/L	U	481782	1349472	100.0 mg/L
SP4-3-TL	0	0.7	5/11/99	Chloroform	0.005	mg/L	U	481782	1349472	6.0 mg/L
SP4-3-TL	0	0.7	5/11/99	Tetrachloroethene	0.005	mg/L	U	481782	1349472	0.7 mg/L
SP4-3-TL	0	0.7	5/11/99	Trichloroethene	0.005	mg/L	U	481782	1349472	0.5 mg/L
SP4-3-TL	0	0.7	5/11/99	Vinyl chloride	0.01	mg/L	UJ	481782	1349472	0.2 mg/L
SP4-3-TM	0	0.7	5/11/99	Arsenic	33.5	ug/L	NV	481782	1349472	5.0 mg/L
SP4-3-TM	0	0.7	5/11/99	Barium	4440	ug/L	NV	481782	1349472	100 mg/L
SP4-3-TM	0	0.7	5/11/99	Cadmium	5	ug/L	NV	481782	1349472	1.0 mg/L
SP4-3-TM	0	0.7	5/11/99	Chromium	6.1	ug/L	NV	481782	1349472	5.0 mg/L
SP4-3-TM	0	0.7	5/11/99	Lead	27.6	ug/L	NV	481782	1349472	5.0 mg/L
SP4-3-TM	0	0.7	5/11/99	Mercury	0.02	ug/L	NV	481782	1349472	0.2 mg/L
SP4-3-TM	0	0.7	5/11/99	Selenium	28	ug/L	NV	481782	1349472	1.0 mg/L
SP4-3-TM	0	0.7	5/11/99	Silver	8.1	ug/L	NV	481782	1349472	5.0 mg/L
SP4-3-TS	0	0.7	5/11/99	1,4-Dichlorobenzene	0.05	mg/L	U	481782	1349472	7.5 mg/L
SP4-3-TS	0	0.7	5/11/99	2,4,5-TP (Silvex)	0.01	mg/L	U	481782	1349472	1.0 mg/L
SP4-3-TS	0	0.7	5/11/99	2,4,5-Trichlorophenol	0.05	mg/L	U	481782	1349472	400 mg/L
SP4-3-TS	0	0.7	5/11/99	2,4,6-Trichlorophenol	0.05	mg/L	U	481782	1349472	2.0 mg/L
SP4-3-TS	0	0.7	5/11/99	2,4-D	0.04	mg/L	U	481782	1349472	10.0 mg/L
SP4-3-TS	0	0.7	5/11/99	2,4-Dinitrotoluene	0.05	mg/L	U	481782	1349472	0.13 mg/L
SP4-3-TS	0	0.7	5/11/99	Chlordane	0.0025	mg/L	U	481782	1349472	0.03 mg/L

1-2575

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP4-3-TS	0	0.7	5/11/99	Endrin	0.00025	mg/L	U	481782	1349472	0.02 mg/L
SP4-3-TS	0	0.7	5/11/99	gamma-BHC (Lindane)	0.00025	mg/L	U	481782	1349472	0.4 mg/L
SP4-3-TS	0	0.7	5/11/99	Heptachlor	0.00025	mg/L	U	481782	1349472	0.008 mg/L
SP4-3-TS	0	0.7	5/11/99	Heptachlor epoxide	0.00025	mg/L	U	481782	1349472	0.008 mg/L
SP4-3-TS	0	0.7	5/11/99	Hexachlorobenzene	0.05	mg/L	U	481782	1349472	0.13 mg/L
SP4-3-TS	0	0.7	5/11/99	Hexachlorobutadiene	0.05	mg/L	U	481782	1349472	0.5 mg/L
SP4-3-TS	0	0.7	5/11/99	Hexachloroethane	0.05	mg/L	U	481782	1349472	3.0 mg/L
SP4-3-TS	0	0.7	5/11/99	m,p-Methylphenol	0.05	mg/L	U	481782	1349472	200 mg/L
SP4-3-TS	0	0.7	5/11/99	Methoxychlor	0.0005	mg/L	UJ	481782	1349472	10.0 mg/L
SP4-3-TS	0	0.7	5/11/99	Nitrobenzene	0.05	mg/L	U	481782	1349472	2.0 mg/L
SP4-3-TS	0	0.7	5/11/99	o-Methylphenol	0.05	mg/L	U	481782	1349472	200 mg/L
SP4-3-TS	0	0.7	5/11/99	Pentachlorophenol	0.25	mg/L	U	481782	1349472	100.0 mg/L
SP4-3-TS	0	0.7	5/11/99	Pyridine	0.05	mg/L	U	481782	1349472	5.0 mg/L
SP4-3-TS	0	0.7	5/11/99	Toxaphene	0.01	mg/L	U	481782	1349472	0.5 mg/L
SP4-4-B1-L	1.5	1.9	5/11/99	1,1-Dichloroethene	10	ug/kg	U	481827	1349353	*11400 ug/kg*
SP4-4-B1-L	1.5	1.9	5/11/99	Bromodichloromethane	10	ug/kg	U	481827	1349353	*903 ug/kg*
SP4-4-B1-L	1.5	1.9	5/11/99	Chloroethane	10	ug/kg	UJ	481827	1349353	3.92×10^8 ug/kg
SP4-4-B1-L	1.5	1.9	5/11/99	cis-1,2-Dichloroethene	10	ug/kg	U	481827	1349353	*11400 ug/kg*
SP4-4-B1-L	1.5	1.9	5/11/99	Tetrachloroethene	10	ug/kg	U	481827	1349353	1.28×10^5 ug/kg
SP4-4-B1-L	1.5	1.9	5/11/99	trans-1,2-Dichloroethene	10	ug/kg	U	481827	1349353	*11400 ug/kg*
SP4-4-B1-L	1.5	1.9	5/11/99	Trichloroethene	10	ug/kg	U	481827	1349353	1.28×10^5 ug/kg
SP4-4-B1-L	1.5	1.9	5/11/99	Vinyl chloride	10	ug/kg	UJ	481827	1349353	*1510 ug/kg*
SP4-4-L	0	1.5	5/11/99	1,1-Dichloroethene	10	ug/kg	U	481827	1349353	*11400 ug/kg*
SP4-4-L	0	1.5	5/11/99	Bromodichloromethane	10	ug/kg	U	481827	1349353	*903 ug/kg*
SP4-4-L	0	1.5	5/11/99	Chloroethane	10	ug/kg	UJ	481827	1349353	3.92×10^8 ug/kg
SP4-4-L	0	1.5	5/11/99	cis-1,2-Dichloroethene	10	ug/kg	U	481827	1349353	*11400 ug/kg*
SP4-4-L	0	1.5	5/11/99	Tetrachloroethene	10	ug/kg	U	481827	1349353	1.28×10^5 ug/kg
SP4-4-L	0	1.5	5/11/99	trans-1,2-Dichloroethene	10	ug/kg	U	481827	1349353	*11400 ug/kg*
SP4-4-L	0	1.5	5/11/99	Trichloroethene	10	ug/kg	U	481827	1349353	1.28×10^5 ug/kg
SP4-4-L	0	1.5	5/11/99	Vinyl chloride	10	ug/kg	UJ	481827	1349353	*1510 ug/kg*
SP4-4-P	0	1.5	5/11/99	alpha-Chlordane	1.7	ug/kg	U	481827	1349353	*2890 ug/kg*
SP4-4-P	0	1.5	5/11/99	Toxaphene	67	ug/kg	U	481827	1349353	1.06×10^8 ug/kg
SP4-4-R	0	1.5	5/11/99	Technetium-99	0.54	pCi/g dry	U	481827	1349353	*29.1 pCi/g*
SP4-4-R	0	1.5	5/11/99	Uranium, Total	3.38	ug/g dry	NV	481827	1349353	*1030 ug/g*
SP4-4-TL	0	1.5	5/11/99	1,1-Dichloroethene	0.005	mg/L	U	481827	1349353	0.7 mg/L
SP4-4-TL	0	1.5	5/11/99	1,2-Dichloroethane	0.005	mg/L	U	481827	1349353	0.5 mg/L
SP4-4-TL	0	1.5	5/11/99	2-Butanone	0.02	mg/L	UJ	481827	1349353	200.0 mg/L
SP4-4-TL	0	1.5	5/11/99	Benzene	0.005	mg/L	U	481827	1349353	0.5 mg/L
SP4-4-TL	0	1.5	5/11/99	Carbon Tetrachloride	0.005	mg/L	U	481827	1349353	0.5 mg/L
SP4-4-TL	0	1.5	5/11/99	Chlorobenzene	0.005	mg/L	U	481827	1349353	100.0 mg/L
SP4-4-TL	0	1.5	5/11/99	Chloroform	0.005	mg/L	U	481827	1349353	6.0 mg/L

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP4-4-TL	0	1.5	5/11/99	Tetrachloroethene	0.005	mg/L	U	481827	1349353	0.7 mg/L
SP4-4-TL	0	1.5	5/11/99	Trichloroethene	0.005	mg/L	U	481827	1349353	0.5 mg/L
SP4-4-TL	0	1.5	5/11/99	Vinyl chloride	0.01	mg/L	UJ	481827	1349353	0.2 mg/L
SP4-4-TM	0	1.5	5/11/99	Arsenic	33.5	ug/L	NV	481827	1349353	5.0 mg/L
SP4-4-TM	0	1.5	5/11/99	Barium	3020	ug/L	NV	481827	1349353	100 mg/L
SP4-4-TM	0	1.5	5/11/99	Cadmium	2.5	ug/L	NV	481827	1349353	1.0 mg/L
SP4-4-TM	0	1.5	5/11/99	Chromium	9	ug/L	NV	481827	1349353	5.0 mg/L
SP4-4-TM	0	1.5	5/11/99	Lead	27.6	ug/L	NV	481827	1349353	5.0 mg/L
SP4-4-TM	0	1.5	5/11/99	Mercury	0.02	ug/L	NV	481827	1349353	0.2 mg/L
SP4-4-TM	0	1.5	5/11/99	Selenium	28	ug/L	NV	481827	1349353	1.0 mg/L
SP4-4-TM	0	1.5	5/11/99	Silver	5.7	ug/L	NV	481827	1349353	5.0 mg/L
SP4-4-TS	0	1.5	5/11/99	1,4-Dichlorobenzene	0.05	mg/L	U	481827	1349353	7.5 mg/L
SP4-4-TS	0	1.5	5/11/99	2,4,5-TP (Silvex)	0.01	mg/L	U	481827	1349353	1.0 mg/L
SP4-4-TS	0	1.5	5/11/99	2,4,5-Trichlorophenol	0.05	mg/L	U	481827	1349353	400 mg/L
SP4-4-TS	0	1.5	5/11/99	2,4,6-Trichlorophenol	0.05	mg/L	U	481827	1349353	2.0 mg/L
SP4-4-TS	0	1.5	5/11/99	2,4-D	0.04	mg/L	U	481827	1349353	10.0 mg/L
SP4-4-TS	0	1.5	5/11/99	2,4-Dinitrotoluene	0.05	mg/L	U	481827	1349353	0.13 mg/L
SP4-4-TS	0	1.5	5/11/99	Chlordane	0.0025	mg/L	U	481827	1349353	0.03 mg/L
SP4-4-TS	0	1.5	5/11/99	Endrin	0.00025	mg/L	U	481827	1349353	0.02 mg/L
SP4-4-TS	0	1.5	5/11/99	gamma-BHC (Lindane)	0.00025	mg/L	U	481827	1349353	0.4 mg/L
SP4-4-TS	0	1.5	5/11/99	Heptachlor	0.00025	mg/L	U	481827	1349353	0.008 mg/L
SP4-4-TS	0	1.5	5/11/99	Heptachlor epoxide	0.00025	mg/L	U	481827	1349353	0.008 mg/L
SP4-4-TS	0	1.5	5/11/99	Hexachlorobenzene	0.05	mg/L	U	481827	1349353	0.13 mg/L
SP4-4-TS	0	1.5	5/11/99	Hexachlorobutadiene	0.05	mg/L	U	481827	1349353	0.5 mg/L
SP4-4-TS	0	1.5	5/11/99	Hexachloroethane	0.05	mg/L	U	481827	1349353	3.0 mg/L
SP4-4-TS	0	1.5	5/11/99	m,p-Methylphenol	0.05	mg/L	U	481827	1349353	200 mg/L
SP4-4-TS	0	1.5	5/11/99	Methoxychlor	0.0005	mg/L	UJ	481827	1349353	10.0 mg/L
SP4-4-TS	0	1.5	5/11/99	Nitrobenzene	0.05	mg/L	U	481827	1349353	2.0 mg/L
SP4-4-TS	0	1.5	5/11/99	o-Methylphenol	0.05	mg/L	U	481827	1349353	200 mg/L
SP4-4-TS	0	1.5	5/11/99	Pentachlorophenol	0.25	mg/L	U	481827	1349353	100.0 mg/L
SP4-4-TS	0	1.5	5/11/99	Pyridine	0.05	mg/L	U	481827	1349353	5.0 mg/L
SP4-4-TS	0	1.5	5/11/99	Toxaphene	0.01	mg/L	U	481827	1349353	0.5 mg/L
SP4-5-R	2	3.5	5/11/99	Technetium-99	0.15	pCi/g dry	U	481800	1349395	*29.1 pCi/g*
SP4-5-R	2	3.5	5/11/99	Uranium, Total	11.9	ug/g dry	NV	481800	1349395	*1030 ug/g*
SP4-6-B1-L	1.5	2	5/11/99	1,1-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B1-L	1.5	2	5/11/99	Bromodichloromethane	10	ug/kg	U	481805	1349429	*903 ug/kg*
SP4-6-B1-L	1.5	2	5/11/99	Chloroethane	10	ug/kg	U	481805	1349429	*3.92×10^8 ug/kg*
SP4-6-B1-L	1.5	2	5/11/99	cis-1,2-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B1-L	1.5	2	5/11/99	Tetrachloroethene	10	ug/kg	U	481805	1349429	*1.28×10^5 ug/kg*
SP4-6-B1-L	1.5	2	5/11/99	trans-1,2-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B1-L	1.5	2	5/11/99	Trichloroethene	10	ug/kg	U	481805	1349429	*1.28×10^5 ug/kg*
SP4-6-B1-L	1.5	2	5/11/99	Vinyl chloride	10	ug/kg	UJ	481805	1349429	*1510 ug/kg*
SP4-6-B2-L	5.5	6	5/11/99	1,1-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*

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APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP4-6-B2-L	5.5	6	5/11/99	Bromodichloromethane	10	ug/kg	U	481805	1349429	*903 ug/kg*
SP4-6-B2-L	5.5	6	5/11/99	Chloroethane	10	ug/kg	U	481805	1349429	*3.92×10^{8} ug/kg*
SP4-6-B2-L	5.5	6	5/11/99	cis-1,2-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B2-L	5.5	6	5/11/99	Tetrachloroethene	10	ug/kg	U	481805	1349429	*1.28×10^{5} ug/kg*
SP4-6-B2-L	5.5	6	5/11/99	trans-1,2-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B2-L	5.5	6	5/11/99	Trichloroethene	10	ug/kg	U	481805	1349429	*1.28×10^{5} ug/kg*
SP4-6-B2-L	5.5	6	5/11/99	Vinyl chloride	10	ug/kg	UJ	481805	1349429	*1510 ug/kg*
SP4-6-B3-L	8.5	9	5/11/99	1,1-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B3-L	8.5	9	5/11/99	Bromodichloromethane	10	ug/kg	U	481805	1349429	*903 ug/kg*
SP4-6-B3-L	8.5	9	5/11/99	Chloroethane	10	ug/kg	U	481805	1349429	*3.92×10^{8} ug/kg*
SP4-6-B3-L	8.5	9	5/11/99	cis-1,2-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B3-L	8.5	9	5/11/99	Tetrachloroethene	10	ug/kg	U	481805	1349429	*1.28×10^{5} ug/kg*
SP4-6-B3-L	8.5	9	5/11/99	trans-1,2-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B3-L	8.5	9	5/11/99	Trichloroethene	10	ug/kg	U	481805	1349429	*1.28×10^{5} ug/kg*
SP4-6-B3-L	8.5	9	5/11/99	Vinyl chloride	10	ug/kg	UJ	481805	1349429	*1510 ug/kg*
SP4-6-B4-L	10.5	11	5/11/99	1,1-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B4-L	10.5	11	5/11/99	Bromodichloromethane	10	ug/kg	U	481805	1349429	*903 ug/kg*
SP4-6-B4-L	10.5	11	5/11/99	Chloroethane	10	ug/kg	UJ	481805	1349429	*3.92×10^{8} ug/kg*
SP4-6-B4-L	10.5	11	5/11/99	cis-1,2-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B4-L	10.5	11	5/11/99	Tetrachloroethene	10	ug/kg	U	481805	1349429	*1.28×10^{5} ug/kg*
SP4-6-B4-L	10.5	11	5/11/99	trans-1,2-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B4-L	10.5	11	5/11/99	Trichloroethene	10	ug/kg	U	481805	1349429	*1.28×10^{5} ug/kg*
SP4-6-B4-L	10.5	11	5/11/99	Vinyl chloride	10	ug/kg	UJ	481805	1349429	*1510 ug/kg*
SP4-6-B5-L	11	11.4	5/11/99	1,1-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B5-L	11	11.4	5/11/99	Bromodichloromethane	10	ug/kg	U	481805	1349429	*903 ug/kg*
SP4-6-B5-L	11	11.4	5/11/99	Chloroethane	10	ug/kg	UJ	481805	1349429	*3.92×10^{8} ug/kg*
SP4-6-B5-L	11	11.4	5/11/99	cis-1,2-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B5-L	11	11.4	5/11/99	Tetrachloroethene	10	ug/kg	U	481805	1349429	*1.28×10^{5} ug/kg*
SP4-6-B5-L	11	11.4	5/11/99	trans-1,2-Dichloroethene	10	ug/kg	U	481805	1349429	*11400 ug/kg*
SP4-6-B5-L	11	11.4	5/11/99	Trichloroethene	10	ug/kg	U	481805	1349429	*1.28×10^{5} ug/kg*
SP4-6-B5-L	11	11.4	5/11/99	Vinyl chloride	10	ug/kg	UJ	481805	1349429	*1510 ug/kg*
SP4-6-P	2	3.5	5/11/99	alpha-Chlordane	1.7	ug/kg	U	481805	1349429	*2890 ug/kg*
SP4-6-P	2	3.5	5/11/99	Toxaphene	67	ug/kg	U	481805	1349429	*1.06×10^{8} ug/kg*
SP4-6-R	2	3.5	5/11/99	Technetium-99	0.64	pCi/g dry	U	481805	1349429	*29.1 pCi/g*
SP4-6-R	2	3.5	5/11/99	Uranium, Total	14.8	ug/g dry	NV	481805	1349429	*1030 ug/g*
SP4-6-TL	2	3.5	5/11/99	1,1-Dichloroethene	0.005	mg/L	U	481805	1349429	0.7 mg/L
SP4-6-TL	2	3.5	5/11/99	1,2-Dichloroethane	0.005	mg/L	U	481805	1349429	0.5 mg/L
SP4-6-TL	2	3.5	5/11/99	2-Butanone	0.02	mg/L	UJ	481805	1349429	200.0 mg/L
SP4-6-TL	2	3.5	5/11/99	Benzene	0.005	mg/L	U	481805	1349429	0.5 mg/L

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP4-6-TL	2	3.5	5/11/99	Carbon Tetrachloride	0.005	mg/L	U	481805	1349429	0.5 mg/L
SP4-6-TL	2	3.5	5/11/99	Chlorobenzene	0.005	mg/L	U	481805	1349429	100.0 mg/L
SP4-6-TL	2	3.5	5/11/99	Chloroform	0.005	mg/L	U	481805	1349429	6.0 mg/L
SP4-6-TL	2	3.5	5/11/99	Tetrachloroethene	0.005	mg/L	U	481805	1349429	0.7 mg/L
SP4-6-TL	2	3.5	5/11/99	Trichloroethene	0.005	mg/L	U	481805	1349429	0.5 mg/L
SP4-6-TL	2	3.5	5/11/99	Vinyl chloride	0.01	mg/L	UJ	481805	1349429	0.2 mg/L
SP4-6-TM	2	3.5	5/11/99	Arsenic	33.5	ug/L	NV	481805	1349429	5.0 mg/L
SP4-6-TM	2	3.5	5/11/99	Barium	3220	ug/L	NV	481805	1349429	100 mg/L
SP4-6-TM	2	3.5	5/11/99	Cadmium	4.5	ug/L	NV	481805	1349429	1.0 mg/L
SP4-6-TM	2	3.5	5/11/99	Chromium	6.7	ug/L	NV	481805	1349429	5.0 mg/L
SP4-6-TM	2	3.5	5/11/99	Lead	27.6	ug/L	NV	481805	1349429	5.0 mg/L
SP4-6-TM	2	3.5	5/11/99	Mercury	0.02	ug/L	NV	481805	1349429	0.2 mg/L
SP4-6-TM	2	3.5	5/11/99	Selenium	28	ug/L	NV	481805	1349429	1.0 mg/L
SP4-6-TM	2	3.5	5/11/99	Silver	5.4	ug/L	NV	481805	1349429	5.0 mg/L
SP4-6-TS	2	3.5	5/11/99	1,4-Dichlorobenzene	0.05	mg/L	U	481805	1349429	7.5 mg/L
SP4-6-TS	2	3.5	5/11/99	2,4,5-Trichlorophenol	0.05	mg/L	U	481805	1349429	400 mg/L
SP4-6-TS	2	3.5	5/11/99	2,4,6-Trichlorophenol	0.05	mg/L	U	481805	1349429	2.0 mg/L
SP4-6-TS	2	3.5	5/11/99	2,4-Dinitrotoluene	0.05	mg/L	U	481805	1349429	0.13 mg/L
SP4-6-TS	2	3.5	5/11/99	Chlordane	0.0025	mg/L	U	481805	1349429	0.03 mg/L
SP4-6-TS	2	3.5	5/11/99	Endrin	0.00025	mg/L	U	481805	1349429	0.02 mg/L
SP4-6-TS	2	3.5	5/11/99	gamma-BHC (Lindane)	0.00025	mg/L	U	481805	1349429	0.4 mg/L
SP4-6-TS	2	3.5	5/11/99	Heptachlor	0.00025	mg/L	U	481805	1349429	0.008 mg/L
SP4-6-TS	2	3.5	5/11/99	Heptachlor epoxide	0.00025	mg/L	U	481805	1349429	0.008 mg/L
SP4-6-TS	2	3.5	5/11/99	Hexachlorobenzene	0.05	mg/L	U	481805	1349429	0.13 mg/L
SP4-6-TS	2	3.5	5/11/99	Hexachlorobutadiene	0.05	mg/L	U	481805	1349429	0.5 mg/L
SP4-6-TS	2	3.5	5/11/99	Hexachloroethane	0.05	mg/L	U	481805	1349429	3.0 mg/L
SP4-6-TS	2	3.5	5/11/99	m,p-Methylphenol	0.05	mg/L	U	481805	1349429	200 mg/L
SP4-6-TS	2	3.5	5/11/99	Methoxychlor	0.0005	mg/L	UJ	481805	1349429	10.0 mg/L
SP4-6-TS	2	3.5	5/11/99	Nitrobenzene	0.05	mg/L	U	481805	1349429	2.0 mg/L
SP4-6-TS	2	3.5	5/11/99	o-Methylphenol	0.05	mg/L	U	481805	1349429	200 mg/L
SP4-6-TS	2	3.5	5/11/99	Pentachlorophenol	0.25	mg/L	U	481805	1349429	100.0 mg/L
SP4-6-TS	2	3.5	5/11/99	Pyridine	0.05	mg/L	U	481805	1349429	5.0 mg/L
SP4-6-TS	2	3.5	5/11/99	Toxaphene	0.01	mg/L	U	481805	1349429	0.5 mg/L
SP4-7-R	1.5	3	5/11/99	Technetium-99	0.645	pCi/g dry	U	481813	1349469	*29.1 pCi/g*
SP4-7-R	1.5	3	5/11/99	Uranium, Total	15.2	ug/g dry	NV	481813	1349469	*1030 ug/g*
SP4-7-S	1.5	3	5/11/99	4-Nitroaniline	820	ug/kg	UJ	481813	1349469	*44.2 ug/kg*
SP4-7-S	1.5	3	5/11/99	bis(2-Chloroisopropyl) ether	330	ug/kg	UJ	481813	1349469	*24.4 ug/kg*
SP4-7-S	1.5	3	5/11/99	Carbazole	330	ug/kg	U	481813	1349469	*7.27×10^{7} ug/kg*
SP4-8-R	0	1.5	5/12/99	Technetium-99	0.35	pCi/g dry	U	481852	1349383	*29.1 pCi/g*
SP4-8-R	0	1.5	5/12/99	Uranium, Total	12.4	ug/g dry	NV	481852	1349383	*1030 ug/g*
SP4-9-B1-L	2.5	3	5/12/99	1,1-Dichloroethene	10	ug/kg	U	481855	1349420	*11400 ug/kg*
SP4-9-B1-L	2.5	3	5/12/99	Bromodichloromethane	10	ug/kg	U	481855	1349420	*903 ug/kg*
SP4-9-B1-L	2.5	3	5/12/99	Chloroethane	10	ug/kg	U	481855	1349420	*3.92×10^{8} ug/kg*

130

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP4-9-B1-L	2.5	3	5/12/99	cis-1,2-Dichloroethene	10	ug/kg	U	481855	1349420	*11400 ug/kg*
SP4-9-B1-L	2.5	3	5/12/99	Tetrachloroethene	10	ug/kg	U	481855	1349420	*1.28×10^5 ug/kg*
SP4-9-B1-L	2.5	3	5/12/99	trans-1,2-Dichloroethene	10	ug/kg	U	481855	1349420	*11400 ug/kg*
SP4-9-B1-L	2.5	3	5/12/99	Trichloroethene	10	ug/kg	U	481855	1349420	*1.28×10^5 ug/kg*
SP4-9-B1-L	2.5	3	5/12/99	Vinyl chloride	10	ug/kg	UJ	481855	1349420	*1510 ug/kg*
SP4-9-B2-L	3	3.4	5/12/99	1,1-Dichloroethene	10	ug/kg	U	481855	1349420	*11400 ug/kg*
SP4-9-B2-L	3	3.4	5/12/99	Bromodichloromethane	10	ug/kg	U	481855	1349420	*903 ug/kg*
SP4-9-B2-L	3	3.4	5/12/99	Chloroethane	10	ug/kg	U	481855	1349420	*3.92×10^8 ug/kg*
SP4-9-B2-L	3	3.4	5/12/99	cis-1,2-Dichloroethene	10	ug/kg	U	481855	1349420	*11400 ug/kg*
SP4-9-B2-L	3	3.4	5/12/99	Tetrachloroethene	10	ug/kg	U	481855	1349420	*1.28×10^5 ug/kg*
SP4-9-B2-L	3	3.4	5/12/99	trans-1,2-Dichloroethene	10	ug/kg	U	481855	1349420	*11400 ug/kg*
SP4-9-B2-L	3	3.4	5/12/99	Trichloroethene	10	ug/kg	U	481855	1349420	*1.28×10^5 ug/kg*
SP4-9-B2-L	3	3.4	5/12/99	Vinyl chloride	10	ug/kg	UJ	481855	1349420	*1510 ug/kg*
SP4-9-P	0	1.5	5/12/99	alpha-Chlordane	1.7	ug/kg	U	481855	1349420	*2890 ug/kg*
SP4-9-P	0	1.5	5/12/99	Toxaphene	67	ug/kg	U	481855	1349420	*1.06×10^8 ug/kg*
SP4-9-R	0	1.5	5/12/99	Technetium-99	0.16	pCi/g dry	U	481855	1349420	*29.1 pCi/g*
SP4-9-R	0	1.5	5/12/99	Uranium, Total	16	ug/g dry	NV	481855	1349420	*1030 ug/g*
SP4-9-TL	0	1.5	5/12/99	1,1-Dichloroethene	0.005	mg/L	U	481855	1349420	0.7 mg/L
SP4-9-TL	0	1.5	5/12/99	1,2-Dichloroethane	0.005	mg/L	U	481855	1349420	0.5 mg/L
SP4-9-TL	0	1.5	5/12/99	2-Butanone	0.02	mg/L	UJ	481855	1349420	200.0 mg/L
SP4-9-TL	0	1.5	5/12/99	Benzene	0.005	mg/L	U	481855	1349420	0.5 mg/L
SP4-9-TL	0	1.5	5/12/99	Carbon Tetrachloride	0.005	mg/L	U	481855	1349420	0.5 mg/L
SP4-9-TL	0	1.5	5/12/99	Chlorobenzene	0.005	mg/L	U	481855	1349420	100.0 mg/L
SP4-9-TL	0	1.5	5/12/99	Chloroform	0.005	mg/L	U	481855	1349420	6.0 mg/L
SP4-9-TL	0	1.5	5/12/99	Tetrachloroethene	0.005	mg/L	U	481855	1349420	0.7 mg/L
SP4-9-TL	0	1.5	5/12/99	Trichloroethene	0.005	mg/L	U	481855	1349420	0.5 mg/L
SP4-9-TL	0	1.5	5/12/99	Vinyl chloride	0.01	mg/L	UJ	481855	1349420	0.2 mg/L
SP4-9-TM	0	1.5	5/12/99	Arsenic	33.5	ug/L	NV	481855	1349420	5.0 mg/L
SP4-9-TM	0	1.5	5/12/99	Barium	3040	ug/L	NV	481855	1349420	100 mg/L
SP4-9-TM	0	1.5	5/12/99	Cadmium	4.3	ug/L	NV	481855	1349420	1.0 mg/L
SP4-9-TM	0	1.5	5/12/99	Chromium	5.9	ug/L	NV	481855	1349420	5.0 mg/L
SP4-9-TM	0	1.5	5/12/99	Lead	27.6	ug/L	NV	481855	1349420	5.0 mg/L
SP4-9-TM	0	1.5	5/12/99	Mercury	0.02	ug/L	NV	481855	1349420	0.2 mg/L
SP4-9-TM	0	1.5	5/12/99	Selenium	28	ug/L	NV	481855	1349420	1.0 mg/L
SP4-9-TM	0	1.5	5/12/99	Silver	7.4	ug/L	NV	481855	1349420	5.0 mg/L
SP4-9-TS	0	1.5	5/12/99	1,4-Dichlorobenzene	0.05	mg/L	U	481855	1349420	7.5 mg/L
SP4-9-TS	0	1.5	5/12/99	2,4,5-TP (Silvex)	0.01	mg/L	U	481855	1349420	1.0 mg/L
SP4-9-TS	0	1.5	5/12/99	2,4,5-Trichlorophenol	0.05	mg/L	U	481855	1349420	400 mg/L
SP4-9-TS	0	1.5	5/12/99	2,4,6-Trichlorophenol	0.05	mg/L	U	481855	1349420	2.0 mg/L
SP4-9-TS	0	1.5	5/12/99	2,4-D	0.04	mg/L	U	481855	1349420	10.0 mg/L
SP4-9-TS	0	1.5	5/12/99	2,4-Dinitrotoluene	0.05	mg/L	U	481855	1349420	0.13 mg/L
SP4-9-TS	0	1.5	5/12/99	Chlordane	0.0025	mg/L	U	481855	1349420	0.03 mg/L

APPENDIX B
PHYSICAL SAMPLING RESULTS FOR STOCKPILES 1, 2 AND 4

SAMPLE ID	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	SAMPLE DATE	PARAMETER	RESULT	UNITS	VALIDATION QUALIFIER	NORTHING	EASTING	*WAC (OSDF) LIMIT / TCLP LIMIT*
SP4-9-TS	0	1.5	5/12/99	Endrin	0.00025	mg/L	U	481855	1349420	0.02 mg/L
SP4-9-TS	0	1.5	5/12/99	gamma-BHC (Lindane)	0.00025	mg/L	U	481855	1349420	0.4 mg/L
SP4-9-TS	0	1.5	5/12/99	Heptachlor	0.00025	mg/L	U	481855	1349420	0.008 mg/L
SP4-9-TS	0	1.5	5/12/99	Heptachlor epoxide	0.00025	mg/L	U	481855	1349420	0.008 mg/L
SP4-9-TS	0	1.5	5/12/99	Hexachlorobenzene	0.05	mg/L	U	481855	1349420	0.13 mg/L
SP4-9-TS	0	1.5	5/12/99	Hexachlorobutadiene	0.05	mg/L	U	481855	1349420	0.5 mg/L
SP4-9-TS	0	1.5	5/12/99	Hexachloroethane	0.05	mg/L	U	481855	1349420	3.0 mg/L
SP4-9-TS	0	1.5	5/12/99	m,p-Methylphenol	0.05	mg/L	U	481855	1349420	200 mg/L
SP4-9-TS	0	1.5	5/12/99	Methoxychlor	0.0005	mg/L	UJ	481855	1349420	10.0 mg/L
SP4-9-TS	0	1.5	5/12/99	Nitrobenzene	0.05	mg/L	U	481855	1349420	2.0 mg/L
SP4-9-TS	0	1.5	5/12/99	o-Methylphenol	0.05	mg/L	U	481855	1349420	200 mg/L
SP4-9-TS	0	1.5	5/12/99	Pentachlorophenol	0.25	mg/L	U	481855	1349420	100.0 mg/L
SP4-9-TS	0	1.5	5/12/99	Pyridine	0.05	mg/L	U	481855	1349420	5.0 mg/L
SP4-9-TS	0	1.5	5/12/99	Toxaphene	0.01	mg/L	U	481855	1349420	0.5 mg/L
SP4-10-B1-L	9.5	10	5/11/99	1,1-Dichloroethene	10	ug/kg	U	481832	1349427	*11400 ug/kg*
SP4-10-B1-L	9.5	10	5/11/99	Bromodichloromethane	10	ug/kg	U	481832	1349427	*903 ug/kg*
SP4-10-B1-L	9.5	10	5/11/99	Chloroethane	10	ug/kg	UJ	481832	1349427	*3.92×10^8 ug/kg*
SP4-10-B1-L	9.5	10	5/11/99	cis-1,2-Dichloroethene	10	ug/kg	U	481832	1349427	*11400 ug/kg*
SP4-10-B1-L	9.5	10	5/11/99	Tetrachloroethene	10	ug/kg	U	481832	1349427	*1.28×10^5 ug/kg*
SP4-10-B1-L	9.5	10	5/11/99	trans-1,2-Dichloroethene	10	ug/kg	U	481832	1349427	*11400 ug/kg*
SP4-10-B1-L	9.5	10	5/11/99	Trichloroethene	10	ug/kg	U	481832	1349427	*1.28×10^5 ug/kg*
SP4-10-B1-L	9.5	10	5/11/99	Vinyl chloride	10	ug/kg	UJ	481832	1349427	*1510 ug/kg*
SP4-10-R	9	10.4	5/11/99	Technetium-99	0.64	pCi/g dry	U	481832	1349427	*29.1 pCi/g*
SP4-10-R	9	10.4	5/11/99	Uranium, Total	31.9	ug/g dry	NV	481832	1349427	*1030 ug/g*

131

2575